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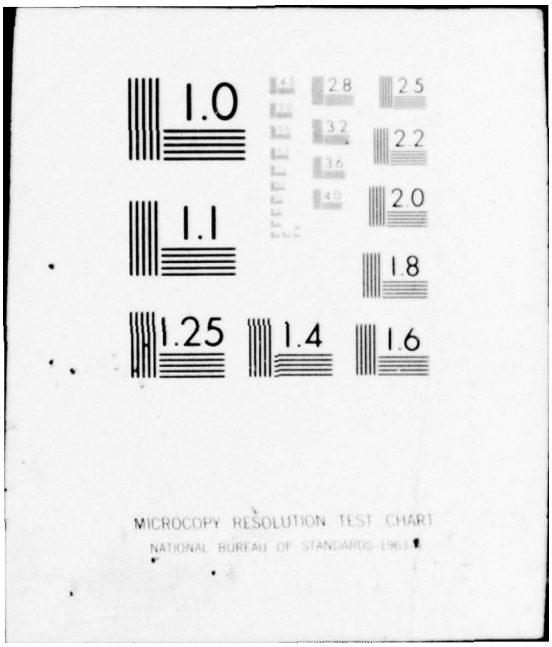
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VESSEL TRAFFIC DATA

GULF COAST INTRACOASTAL WATERWAY

MARCH 1976

FINAL REPORT

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PREPARED FOR
DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD
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16. Abstract

This report presents data concerning vessel traffic in the Gulf Coast Intracoastal Waterway. The data was obtained from films of a radar PPI at four sites in the Gulf Coast Intracoastal Waterway. Also, tapes of communications activity on Channel 13 of the VHF/FM Maritime Mobile Band provided data. Data analysis obtained the following: Vessel Density; Vessel Route Identification; Vessel Speed; Close Encounter; Message Activity; Channel Utilization; and Channel Efficiency.

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VESSEL TRAFFIC DATA
FOR
GULF COAST INTRACOASTAL WATERWAY

FINAL REPORT

L. BUHLER, J. STALEY, T. NIGHTENGALE, P. WALCOTT

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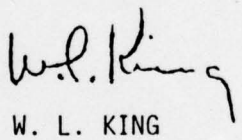

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The authors wish to acknowledge the contribution to the data analysis effort made by the U. S. Coast Guard R&D Center. Early in the effort it was discovered that to obtain significant amounts of communications data would require a considerable amount of time in terms of man-hours. Presented with this problem, the R&D center, in notably minimum time, developed an automated system for extracting data from communications tapes. With this system, the cost of obtaining communications data was significantly reduced. Finally, a comment on the radar films and communications tapes is in order. The films and tapes provided by the R&D center were consistently high quality, thereby easing the problem of data extraction.

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EXECUTIVE SUMMARY

This report is a final report in accordance with Contract DOT-CG 31446-A, Task 14, "VTS Statistical Data Analysis." As per the above contract, this report constitutes the sixth in a series of final reports for selected port areas in the United States.

The report presents data on vessel traffic in the Gulf Coast Intracoastal Waterway area. The data were obtained using the USCG Data Collection Van at four sites in the area. *The Data Collection Van* is equipped with a radar to monitor vessel movements and a communications receiver to monitor communications activity. Specific data contained in the report is as follows:

RADAR

- Vessel Density - A count of the vessels present at a particular time for the data collection radar site. The count is made at regular time intervals. The data is presented in the form of a histogram. Also, vessels are classified as being small, medium, large, at anchor, or tugs with tow, according to the size and behavior of the radar return.

- Vessel Route Identification - A chart depicting the routes used by vessels transiting the area.

- Vessel Speed - A histogram of vessel speeds and a table of speed data information, along with a diagram depicting speed calculation Timing Points.

- Close Encounter - A count of vessel encounters and close encounters observed, using close encounter criteria derived in this report.

COMMUNICATIONS

- Communications Channel Message Activity - A count of the number of messages transmitted on channel 13 of the VHF/FM Maritime Mobile Band, as a function of time. The data is presented in the form of a histogram with message counts totaled in selected fifteen-minute intervals over a 24-hour period.

- Communications Channel Utilization - The percentage of time that squelch is broken on channel 13. Utilization is computed for fifteen-minute intervals over a 24-hour period so that the variation in utilization with time of day can be observed.

- Communications Channel Efficiency - A count of the number of valid and invalid messages on channel 13 of the VHF/FM Maritime Mobile Band. Valid messages are those judged to be conforming to the Bridge-to-Bridge Radiotelephone Act. Counts are totaled within fifteen-minute intervals and a histogram of the ratio of valid messages to total messages is given. The abscissa of the histogram is time of day.

The vessel traffic data presented in the report was obtained by analyzing motion pictures of a radar PPI display. Communications data was collected by monitoring tape recordings of the communications activity on channel 13. The radar films and communications tapes were obtained by the U.S. Coast Guard Data Collection Van. In the Intracoastal Waterway, the van was situated at four different sites to permit the observation and analysis of certain significant activities.

The data obtained for these sites are given in detail in Section II of this report.

General Observations on the Gulf Coast Intracoastal Waterway*

Reviewing all of the Gulf Coast ICW data provided in Section II certain conclusions and observations can be made. They are as follows:

1. Vessel Density

   - A peak traffic period is defined as a time interval during which vessel density is greater than or equal to a percentage of the peak value for the site, and is sustained for more than 15 minutes. The percentage of the peak value chosen allows for significant peak periods to emerge.

---

*Hereafter called Gulf Coast ICW.

The following table displays the peak traffic activity for each site:

Site	% of Peak Value Used	No. of Peak Traffic Periods	Peak Value	Value equal to % of Peak
Houma	50	0	6 vessels	3 vessels
Atchafalaya	75	4	9 vessels	7 vessels
Berwick Lock	75	15	7 vessels	5 vessels
Pleasure Island	75	4	5 vessels	4 vessels

The following observations were made, based on the vessel density data collected:

- Houma - The vessel density counts were generally low – around 2-3 vessels occurring at each count. Relatively uniform traffic activity occurred throughout the time coverage.

- Atchafalaya - Three of the four peak traffic periods were from 1330-1430 hours. A second observation from available data is that vessel density is generally low from 0000 to 1000 hours; it then increases sharply around 1000 hours, and fluctuates around the mean number of vessels for the rest of the day. Saturday, 15 February 1975, is the only day when the vessel density does not follow the preceding trend. This day shows a much higher vessel density count from 0000 to 1000 hours.

- Berwick Lock - Anchored vessels account for the majority of the vessel density data. On the average, there were three vessels anchored at one time, with more or less than 3 vessels anchoring for short periods of time. The high number of peak traffic periods occurred mainly because of the high number of anchored vessels, along with usually only a couple moving vessels. A peak period from 1815-1840 occurred on Friday and Monday. A relatively uniform traffic activity (no significant changes in vessel density) existed, despite the high number of peak periods observed.

- Pleasure Island - Two of the four peak traffic periods were from 1650-1715 hours. The traffic activity remained relatively uniform throughout the time coverage.

Section 1.5 of this report lists all the peak traffic periods for each site.

2. Route Identification. Vessel traffic observations on the four sites in the Gulf Coast ICW were taken individually:

- Houma's traffic was predominantly through-traffic that moved north and south along the Intracoastal Waterway.
- At Atchafalaya, the major vessel movement was from the lower Atchafalaya River into the Intracoastal Waterway. Small ships dominated the scene, but showed no strict route preference.
- Berwick Lock had the most balanced array of vessel type. Traffic flowed mainly in an eastern and western direction.
- The only site where large ships were dominant was Pleasure Island. Here, the most dense traffic was in the northerly trip up Sabine Neches Canal.

In the macroscopic view a similarity among these four sites shows up, each overlooks a junction of waterways. The vessel movements there observed would represent the degrees of utilization of those water bodies which converge at the respective junctions. Section 1.5 of this report offers more detailed information about the types of vessels, direction of advance, and route breakdowns for each site.

3. Vessel Speed. Observed speeds on Gulf Coast ICW had the following ranges:

- Houma - 1-34 knots (9.2 knot average)
- Atchafalaya - 3-28 knots (8.9 knot average)
- Berwick Lock - 1-15 knots (6.1 knot average)
- Pleasure Island - 1-11 knots (5.7 knot average)

More detailed information concerning vessel speeds according to types of vessels is given in Section 1.5 of this report.

4. Close Encounters. The observed rates of close encounters are as follows:

- Houma - 50 in 3 hours (16.7)
- Atchafalaya - 50 in 3¼ hours (15.4)
- Berwick Lock - 21 in 24 hours (0.9)
- Pleasure Island - 19 in 24 hours (0.8)

The numbers in parenthesis are close encounters per hour.

While observing close encounters, account was taken of encounters that were not "close". A close encounter was so determined if the distance between two vessels was below a certain threshold value. This threshold value varied from site to site as a function of the radar range scale at the site and was as follows: Houma – 100 yards; Atchafalaya – 200 yards; Berwick Lock – 150 yards; Pleasure Island – 100 yards. The relationship between encounters and close encounters was as follows:

- Houma - 50 close encounters out of 56 total encounters (89%)
- Atchafalaya - 50 close encounters out of 67 total encounters (75%)
- Berwick Lock - 21 close encounters out of 28 total encounters (75%)
- Pleasure Island - 19 close encounters out of 31 total encounters (61%)

Here, the numbers in parenthesis represent the percentage of close to total encounters. More detailed information regarding close encounters is provided in Section 1.5 of this report.

5. Channel Utilization

Channel 13 utilization exhibited the following peak and average percentages:

Site	Day of Coverage	Peak (%)	Time of Peak	Average (%)
Houma	Tuesday, 21 January, 1975	36	0015 - 0030	11
Atchafalaya	Friday, 31 January, 1975	37	1200 - 1215	7
Berwick Lock	Thursday, 6 February, 1975	30	2000 - 2015	6
Pleasure Island	Wednesday, 5 March, 1975	26	1430 - 1445	3

6. Message Activity

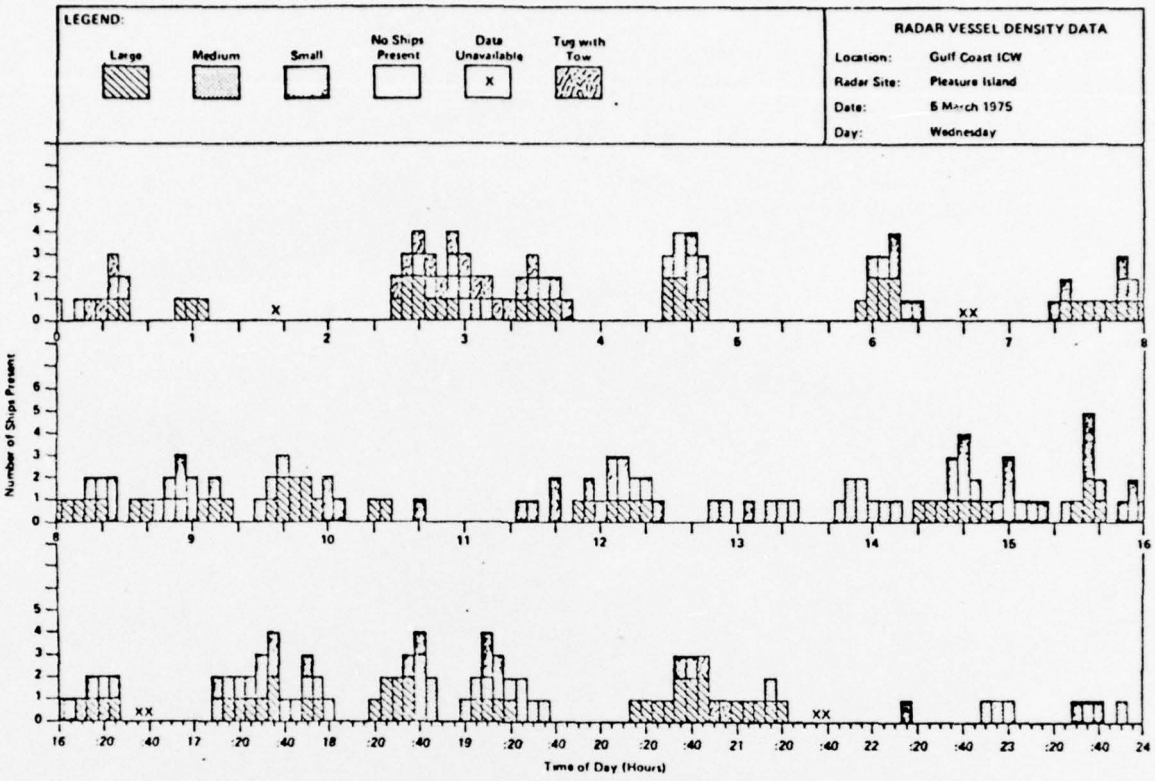
Message activity exhibited the following peak and average values for channel 13.

Site	Day of Coverage	Peak No. of Messages	Time of Peak	Average No. of Messages
Houma	Tuesday, 21 January, 1975	121	0700 - 0715	37
Atchafalaya	Friday, 31 January, 1975	113	1215 - 1230	23
Berwick Lock	Thursday, 6 February, 1975	244	1630 - 1645	48
Pleasure Island	Wednesday, 5 March, 1975	88	1600 - 1615 and 1715 - 1730	14

7. Channel Efficiency. Channel efficiency data are as follows:

Site	Peak (%)	Average (%)
Houma	100	68
Atchafalaya	100	70
Berwick Lock	100	42
Pleasure Island	100	61

A sample of the form in which each of the various types of data is presented is given in Figure E-1.



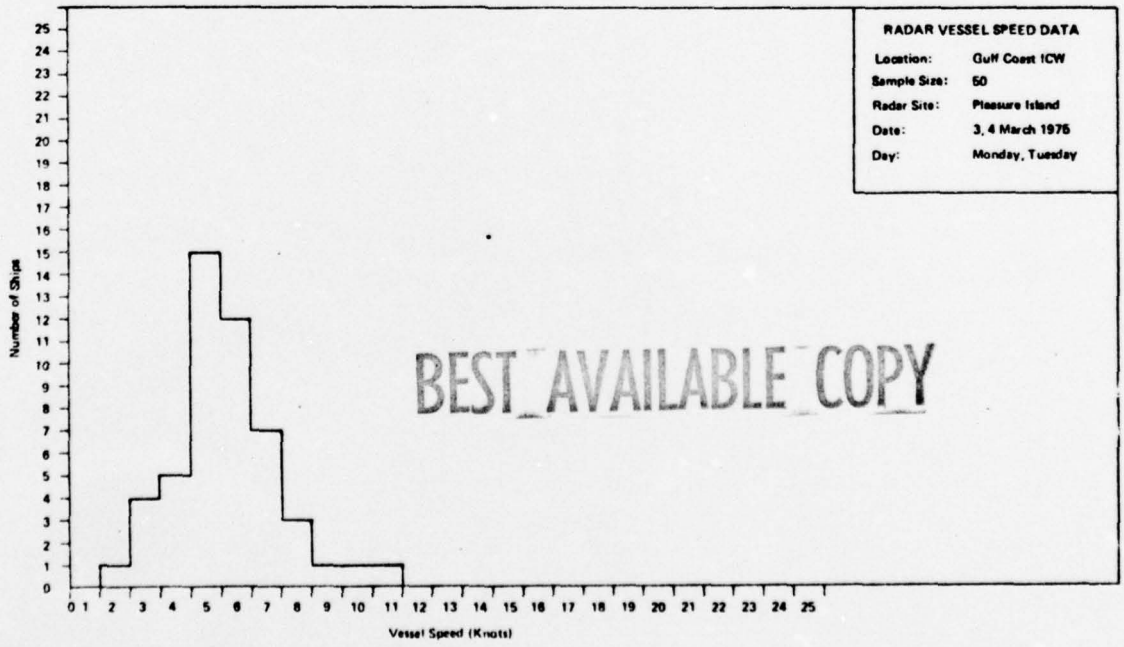


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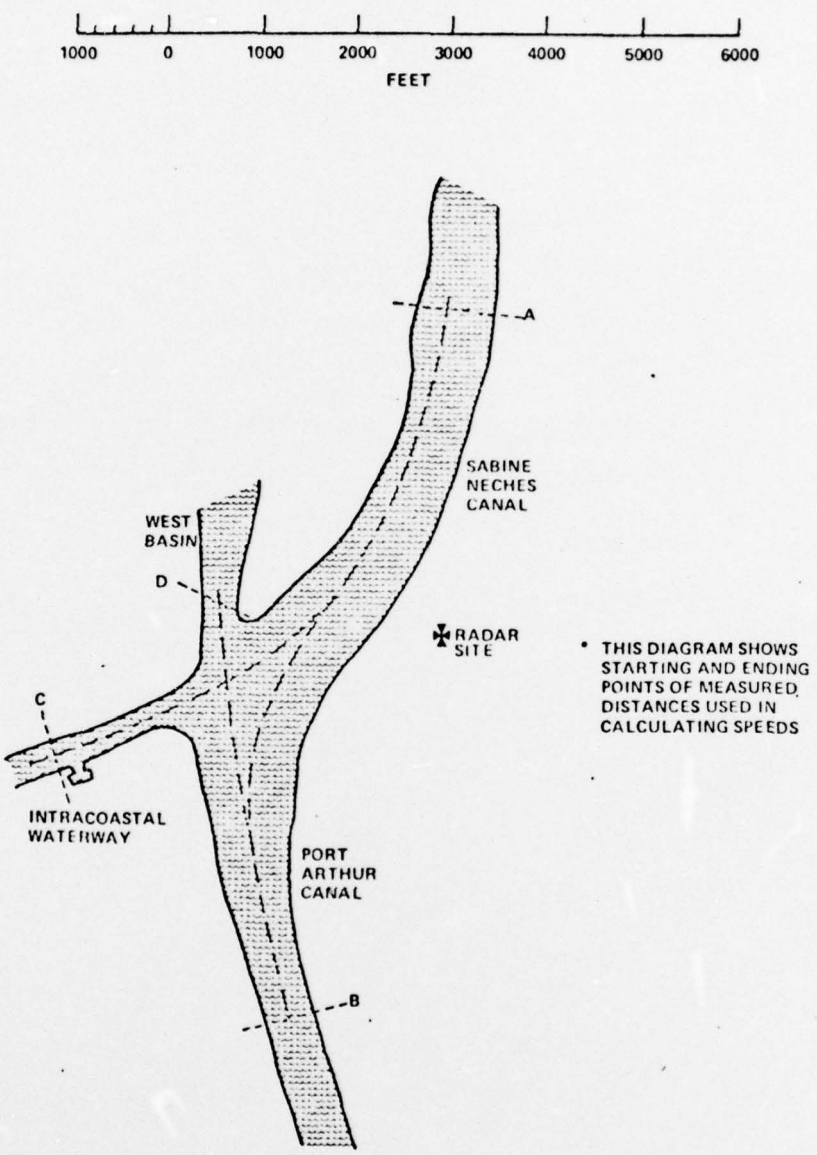
FIGURE E-1. SAMPLE DATA



SPEED CALCULATION TIMING POINTS FOR PLEASURE ISLAND•

FIGURE E-1. SAMPLE DATA (CONT)

CLOSE ENCOUNTER
FOR
PLEASURE ISLAND

No.	Day	Time Hour/Minute		Distance Yards	Size	Manner of Approach*
1	Sunday 9 March 1975	01	53	56	2 large	P
2		07	56	98	2 large	P
3		08	36	98	2 large	P
4		08	44	44	2 large	P
5		08	51	50	2 large	O
6		09	08	65	2 large	O
7		09	12	36	2 large	O
8		09	13	49	2 large	P
9		09	13	31	2 large	P
10		09	14	59	2 large	P
11		12	41	50	1 large, 1 medium	O
12		12	51	89	2 large	P
13		15	21	63	1 medium, 1 small	P
14		15	42	66	2 large	P
15		17	23	75	2 small	P
16		17	24	84	1 large, 1 small	P
17		17	42	50	2 small	P
18		19	39	95	2 large	P
19		21	13	56	1 medium, 1 small	C

19 close encounters out of 31 total encounters in a 24 hour period.

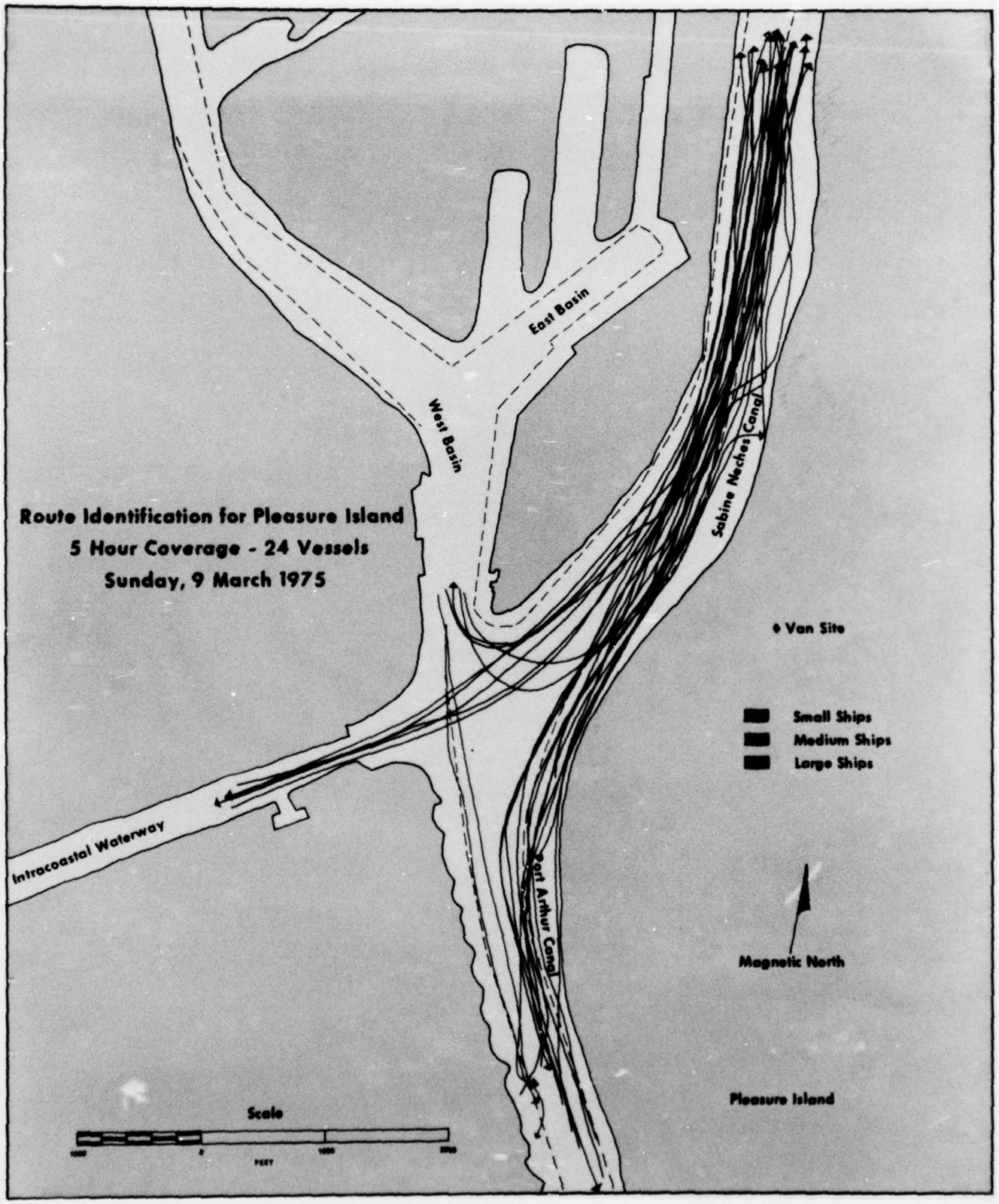
*P = Passing
O = Overtaking
C = Crossing

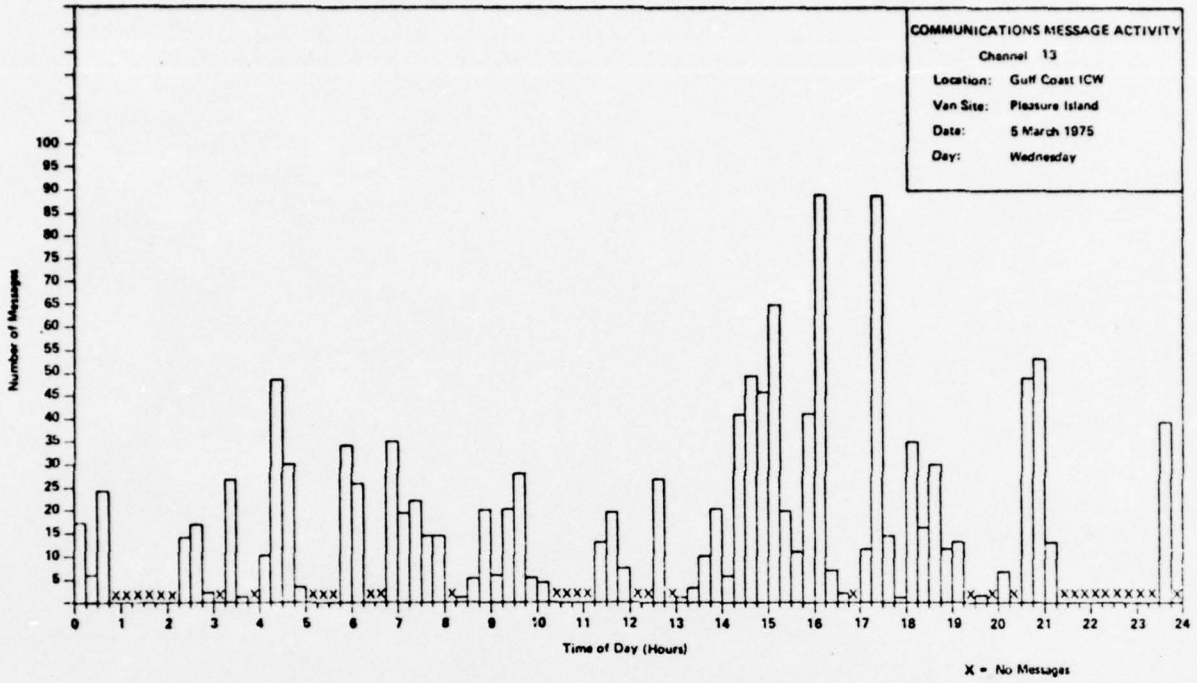
SPEED DATA
FOR
PLEASURE ISLAND

Vessel No.	Vessel Size	Average Speed in Knots	Direction*	Day	Time Hour/Minute	
1	large	3	A-C	3 March 1975 Monday	14	53
2	large	3	C-A		15	01
3	small	7	A-C		15	13
4	small	6	A-B		15	51
5	medium	6	A-C		16	59
6	small	7	A-B		17	13
7	large	10	B-A		17	36
8	large	6	D-B		17	42
9	large	7	B-A		17	45
10	small	8	B-A		18	35
11	small	5	C-B		18	39
12	large	4	C-A		18	44
13	large	7	A-C		19	46
14	medium	4	A-C		19	49
15	large	5	A-C		15	00
16	medium	5	A-B		20	05
17	medium	5	C-A		21	16
18	medium	2	A-D		21	26
19	small	7	A-D		21	43
20	medium	6	A-C		21	45
21	small	8	A-D		21	59
22	small	5	C-B	3 March 1975 Monday	22	30
23	large	6	C-A		23	13
24	large	6	A-C	4 March 1975 Tuesday	00	59
25	large	5	A-C		01	05
26	small	5	D-A		01	16
27	small	5	B-C		01	18

* See Figure "Speed Calculation Timing Points for Pleasure Island"

FIGURE E-1. SAMPLE DATA (CONT)


East Basin
West Basin
Sabine Neches Canal
Route Identification for Pleasure Island
5 Hour Coverage - 24 Vessels
Sunday, 9 March 1975
Van Site
Small Ships
Medium Ships
Large Ships
Intracoastal Waterway
Port Arthur Canal
Magnetic North
Pleasure Island
Scale
FEET



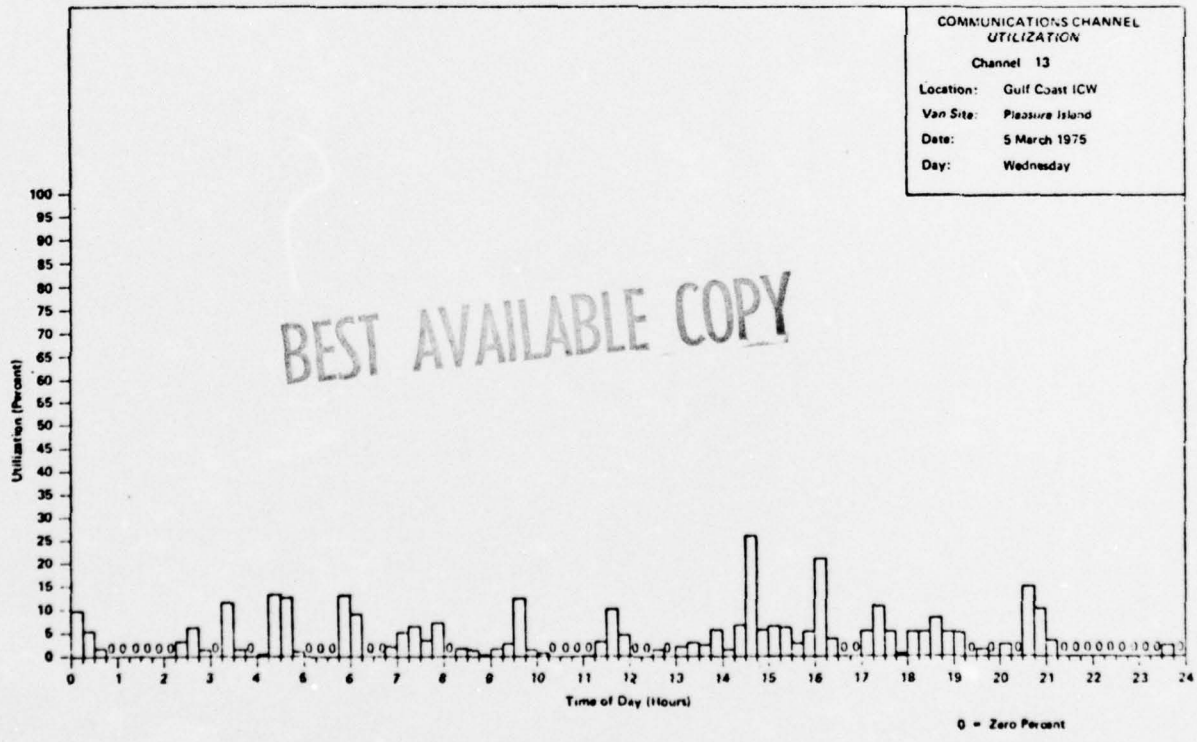


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FIGURE E-1. SAMPLE DATA (CONT)

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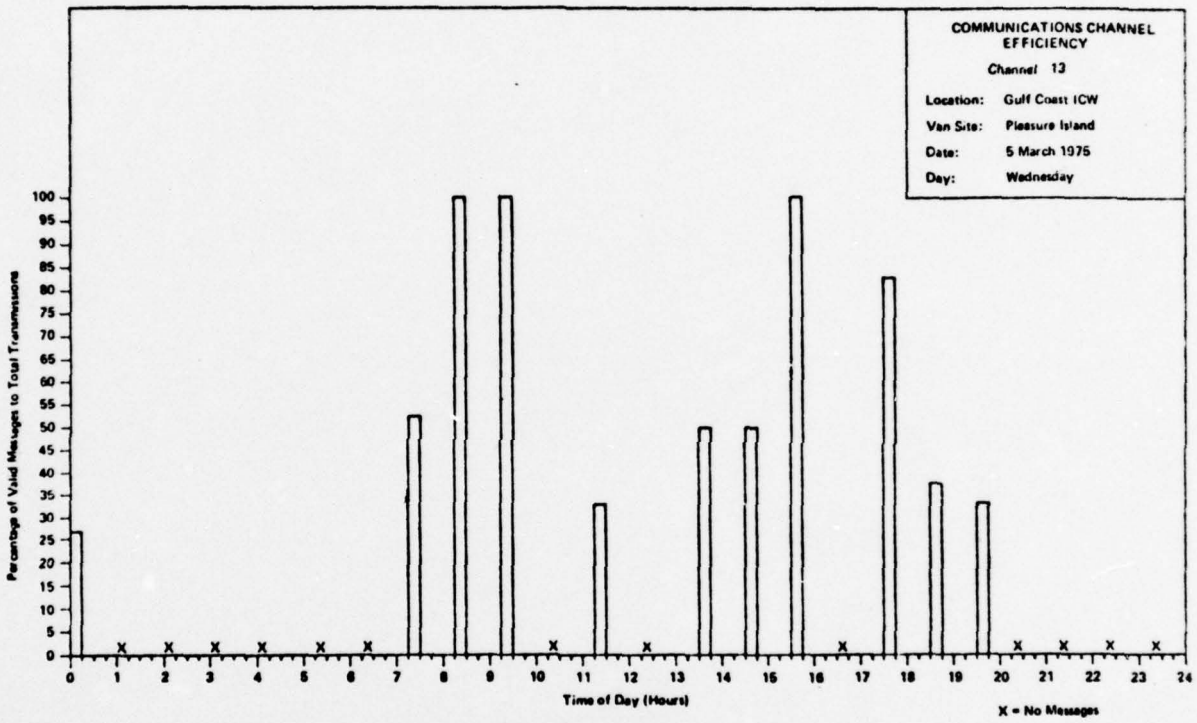


FIGURE E-1. SAMPLE DATA (CONT)

I. DISCUSSION OF DATA

1.1 HOUMA SITE

The four radar sites in this report are on the Intracoastal Waterway (ICW) network, and each includes at least one intersection of this waterway with another navigable inland waterway. At the Houma site, the ICW comes in from the east (New Orleans), heads south for about 3 nm through the city of Houma, and then turns west toward Morgan City. As the ICW makes the westward turn, it is joined by the Houma Navigation Canal. This junction is visible at the southern perimeter of the radar return for the site.

The radar van was situated approximately 0.5 nm north of the ICW-Houma Navigation Canal intersection, and 15 yds. in from the east bank of the ICW. Since the return radius was adjusted to 0.75 nm, the initial area of coverage was small, and the actual waterway observed was further limited by a railroad bridge 0.2 nm north of the radar location. The overall length of visible waterway was thus reduced to less than one nm. This is the smallest coverage area encountered to date in this series of reports. This factor significantly affects all radar data taken for the site, and must be accounted for when comparing this data with that of other sites.

The three approaches to the site are all governed by bridges. The bridges over the two southern approaches — which are just outside of the radar's range — are highway bridges. These give precedence to water traffic, and therefore have little effect on vessel traffic behavior. The bridge over the northern approach is the railroad bridge, and this gives precedence to rail traffic, causing occasional halts in water traffic. Even when it is open to water traffic, it presents a hazard, since the actual water passage width through the bridge is less than 70 feet.

The vessel density data for Houma reflect the limited area of coverage. The average transit time was so low as to require density counts to be taken each five minutes. During almost a week of coverage, the peak vessel density count of 6 was attained at only one five minute sampling time, and counts of five at only three times. The range of possible count values (0 to 6) appears to be too small to allow for the emergence of significant traffic trends. However, the fact that within this limited area there was at least one vessel present at 40% of the sampling times, indicates a steady flow of traffic through the site.

Of the four Gulf Coast ICW sites, Houma has the greatest range of speeds, the fastest single speed, and the highest speed average. The average speed is 9.2 knots, median speed 7 knots. The size of area coverage affects speed data in the important aspect of influencing error bounds. As the distance over which speed measurements are taken decreases, the error bounds expand. The limited visible waterway at this site caused speed data to be taken over small distances of from 0.16 nm to 0.49 nm. This factor may be responsible for the greater range of speeds, and since the low end of the range has a definite limit (zero), it may also have raised the speed average. A greater than usual speed sample (69 vessels) was taken in order to partially dampen this effect. However, even when allowing for the higher error factor, speeds at this site appear very high for inland waterways.

Houma also registered the highest figures for rate of close encounters to encounters (89%) and rate of close encounters per hour (16.7). While the route identification chart depicts a smooth flow of traffic north and south, it also displays the predominance of small vessels. It should be noted that the sites with the highest speeds, speed averages, and rates of close encounters per hour (Houma and Atchafalaya) have route identification charts showing a predominance of small vessels. In fact, when the four sites are ranked by each of these figures (highest speed, speed average, and rate of close encounter per hour) the ranking in each case is identical to the ordering of sites by percent of small vessels to total vessels, as given by route identification charts. These percentages are: Houma, 71%; Atchafalaya, 59%; Berwick Lock, 41%, and Pleasure Island, 29%. The evidence that these rates are directly interrelated is compelling.

Communications data were taken at Houma on Tuesday, 21 January 1975. Although vessel density for the day is average for the site, vessel density for the site is low overall. Low figures for channel utilization and message activity would therefore be expected. The average and peak channel utilization are 11% and 36%; average and peak number of messages (for 15 minute intervals) are 37 and 121. While 11% average channel utilization is a low rate, it is the highest of the four sites. The ranking of sites by average channel utilization is, once again, identical to the ordering of sites by percent of small vessels to total vessels. If the relationship between these figures (percent of small vessels to total vessels, highest speed, speed average, rate of close encounters per hour, and channel utilization) is causal rather than coincidental, the presence of small vessels at a given site may be more significant than their size would suggest.

The message activity figures appear high for such low utilization figures. This may be explained by the method of message activity data extraction. The counts are taken by an automated system which recognized each break of squelch as a "message." When message counts are taken manually[1/], actual messages are counted. Thus manual counts of messages are generally lower since pauses in transmission of a message do not cause the message to be counted more than once. For example, the peak period which has 121 machine counted messages, has 57 messages when counted manually. Since the data extraction for channel efficiency—which is done manually—involves message counting, the manual message activity figures for the sites are easily obtained. For Houma, the average number of manually counted messages (for a 15 minutes period) is 19, which is the highest of the four sites.

The last type of data to be discussed is channel efficiency. At this site it averages 68%. It does not seem to have any significant relationship to vessel density, time of day, channel utilization or message activity. When comparing efficiency to utilization and message activity, a direct relationship holds over 52% and 57% of the intervals, respectively.

[1/] The method of communication data extraction referred to as "manual" is that for which the data taker actually listens to the communications tapes and counts the messages.

1.2 ATCHAFALAYA SITE

Thirty miles west of Houma, at Morgan City, the ICW (Alternate Route from Port Allen) meets a branch of the Lower Atchafalaya River. They flow together south past Morgan City, are joined by the ICW from Houma, and continue southwest for a total of 5½ nm. Then the ICW branches to the west, towards Texas, and the river continues to the south. The point where the ICW branches to the west is visible in the southern portion of the Atchafalaya site radar return. The radar van was located 0.9 nm north-northeast of this point, on the levee on the west bank of the river. With the radar at a return radius of 3 nm, it was able to range more than 2 nm upriver and 1.5 nm downriver, before bends in the river cut its line of sight. A length of about 0.7 nm of river, directly opposite the van site, was obfuscated by a large radar flare. However, this affected data-taking only marginally, since traffic levels were generally low enough to allow for identification of each ship as it entered into and emerged from the flare area.

Although the period of radar coverage at Atchafalaya spanned 2½ weeks, there were numerous gaps in the data. The available data fell on nine separate days, but only four of the nine were complete days of coverage. Certain types of vessel density cycles require a more consistant coverage period for detection. However, the range in vessel counts (0 to 9) is great enough to allow some observations to be made. The four peak traffic periods (Sunday at 1415 to 1430, Monday at 1400 to 1415 and 1645 to 1700, Friday at 1330 to 1345) indicate a tendency to a daily afternoon peak period. Inspection of the vessel density histograms reveals that morning traffic is generally low, picking up after 1000 and remaining high through afternoon and evening. This pattern prevails on three of the four days of complete coverage, with Saturday being the one day differing. Also, of all the days of partial coverage, only Saturday data contradicts the pattern.

Atchafalaya speed figures rank this site as second highest in range of speeds (3 to 28 knots) and average speed (8.9 knots). The median speed of 9 knots, however, is 2 knots higher than the Houma speed median. There is a marked improvement in the speed figures' error bounds at this site, since speed calculations were made over distances of up to 2.8 nm. Atchafalaya is also second in rate of close encounters per hour (15.4); rate of close encounters per encounter (75% for both Atchafalaya and Berwick Lock); and second in rank by percentage of small vessels to total vessels as given by route identification data (59%).

The route identification chart shows a pattern of virtually total through-traffic, which is not surprising as the area surrounding the site is swampland, with only a few structures (construction company sheds, a small boat dock, etc.) lining the banks. The majority of the traffic transiting the site - including all large vessels - enter or leave the river by way of the ICW.

Communications data were taken for Friday, 31 January 1975. Channel utilization is low, with an average of 7% and a peak of 37%. Message activity shows an average of 23 messages per 15 minute interval (the manually extracted data average is 15). Average channel efficiency is 70%. The data shows a positive relationship between channel utilization and message activity, with this relationship holding over 88% of the sampling intervals. Channel utilization and message activity also show a positive relationship with channel efficiency. When comparing these values over time, the relationship holds for 83% of the intervals for channel efficiency and message activity, and for 87% of the intervals for channel efficiency and utilization.

1.3 BERWICK LOCK SITE

The intersection of the ICW (Alternate Route) with the Lower Atchafalaya River at Morgan City (the same intersection which is 5½ nm north of the Atchafalaya site intersection) is within the central area of the radar return for the Berwick Lock site. The radar van was located directly opposite the entrance of the ICW, on the levee on Berwick Island, 0.4 nm north of Berwick Lock. The radar return radius was set at 1.5 nm, and since it ranged in a straight line down the ICW, the full 1.5 nm of this waterway was visible. The other waterways entering the site (Stouts Pass from the northwest and Lower Atchafalaya River from the south and west) were visible for considerably shorter distances. The radar's range was limited in these directions by stands of trees to the north, west, and south of the radar van.

Vessel density data for Berwick Lock is unusual, due to the preponderance of anchored vessels. These anchored vessels are found along the bank of the ICW, presumably waiting for other vessels to clear the narrow curve which lies west of, and out of range of, the radar site. The average transit time for the site necessitated 10 minute sampling periods, and though vessel counts peaked at 7, only one sampling period in a week of data had four moving vessels present. All other samplings resulted in three or less moving vessels. The density of moving vessels was generally so low, that only 12% of all counts included more than one moving vessel; yet 38% of the counts had at least one moving vessel. The picture is one of very low but generally steady traffic.

The Berwick Lock speed, close encounter, and route identification data present no extraordinary features. The speed range (1 to 15 knots), average (6.1 knots), and median (5 knots) can all be considered quite normal for inland waterways. The rate of close encounter per hour is very low (0.9), as would be expected at a site where there is more than one vessel present for only 12% of the time. The rate of close encounter per encounter (75%) seems high for uncongested waters. However, this figure is not high when considering that, for this radar scale, a close encounter is one with the distance between center points of encountering vessels equaling or less than 200 yds. wide; and that the ICW at this site is generally less than 200 yds. wide. The route identification chart shows the majority of traffic to be through traffic, with a few vessels stopping along the ICW in the region of the "anchored" vessels of the vessel density counts. The ICW and Lower Atchafalaya River carry most (68%) of the traffic, and all vessel types are represented.

Communications data were taken for Thursday, 6 February 1975. Channel utilization is low again, with an average of 6% and peak of 30%. Message activity figures appear unusually high, averaging 48 messages per 15 minute period and peaking at 244 messages in 15 minutes. (The manual message activity is lower—18 average and 75 peak—but these figures are still relatively high for the associated utilization figures.) The channel efficiency average of 42% is very low—lowest of the four sites. When comparing message activity and channel utilization, the familiar positive relationship appears, with 75% of the intervals exhibiting the tendency. However, when comparing channel

efficiency to utilization and message activity, a negative relationship emerges. This relationship holds over 55% of the intervals when comparing channel efficiency and utilization; and over 68% when comparing channel efficiency and message activity.

1.4 PLEASURE ISLAND SITE

The Pleasure Island site is the one of the four sites of this report which is not in Louisiana. It is in Texas, very near the Texas-Louisiana border. The ICW, coming west from Louisiana, meets the border at Orange, Texas. It follows the border south to Sabine Lake. The border runs down the middle of the lake, while the ICW cuts across the top of the lake and runs inland and parallel to the lakeshore, past Port Arthur. As it passes Port Arthur, heading southwest, the ICW is renamed Sabine Neches Canal. South of Port Arthur the Sabine Neches Canal joins the Port Arthur Canal. From this point, the Port Arthur Canal continues southeast parallel to the lakeshore; the ICW turns west into Texas; and the West Basin heads north toward Port Arthur. This intersection area is the central focus of the radar return at this site.

The strip of land which is isolated by Sabine Lake on the east, and the ICW-Sabine Neches Canal - Port Arthur Canal waterway on the west, is Pleasure Island. The radar van was located here, about 2000 ft. northeast of the intersection area. The radar return radius was adjusted to 0.75 nm. However, due to the position of the radar van , this range was sufficient to include all four approaches to the intersection area. Visible were: 0.9 nm of the Sabine Neches Canal; 0.6 nm of the Port Arthur Canal; 0.4 nm of the ICW; and the entrance to the West Basin.

The Pleasure Island radar site is at the southern tip of the heavily industrialized "Golden Triangle" area of Port Arthur, Beaumont, and Orange, Texas. The area was so named for the riches extracted from it by the petro-chemical industry. The waterways at the site comprise the Gulf of Mexico entrance to the area, with the Port Arthur Canal bringing vessels up from the Gulf, the West Basin serving the oil refineries of the Port Arthur area, and the Sabine Neches Canal carrying vessels to other "Golden Triangle" dock and port services.

Vessel density data for Pleasure Island is interesting in that, even though the range of count values is low (a peak value of 5), examination of the vessel density histograms reveals an apparent tendency to heavier mid- and late-week traffic. When comparing the week of radar data on a day by day basis, certain evidence of this trend emerges. Due to the small scale of the site, vessel density counts were taken at five minute sampling periods. The daily percentages of sampling periods for which at least one vessel is present, to total sampling periods are as follows:

Sunday	47%	Wednesday	60%
Monday	39%	Thursday	60%
Tuesday	47%	Friday	56%
		Saturday	68%

In other words, on Sunday, Monday, and Tuesday there is not one vessel present within the site for more than half the time; on the remaining days of the week there is at least one vessel present for more than half the time. Although this does indicate a weekly cycle, more than one week of data is required to clearly establish the trend.

The route identification for Pleasure Island clearly shows the predominance of large ships. This site has the lowest percent of small vessels to total vessels (29%). It also registers the lowest figures for all of the following factors: peak vessel density (5 vessels present), speed range (1 to 11 knots), speed average (5.7 knots), close encounters per hour (0.8), close encounters per encounter (0.6), average channel utilization (3%), peak channel utilization (26%), average message activity (14 for automatic data, 3 for manual data), and message activity peak (88 for automatic data, 21 for manual data). It would seem that the difference in vessel density between this site and others is not sufficient to cause such dramatic lows, since all four sites have low vessel density. However, the data does present a picture of a site of very orderly traffic movement.

1.5 DETAILED DATA SUMMARY

The following observations can be made on the data collected for each site on the Gulf Coast ICW:

1. Vessel Density

   - A peak traffic period is defined as a time interval during which vessel density is greater than or equal to a percentage of the peak value for the site, and is sustained for more than 15 minutes. The percentage of the peak value chosen allows for significant peak periods to emerge.

The following table displays the peak traffic activity for each site.

Site	% of Peak Value Used	No. of Peak Traffic Periods	Peak Value	Value Equal to % of Peak
Houma	50	0	6 vessels	3 vessels
Atchafalaya	75	4	9 vessels	7 vessels
Berwick Lock	75	15	7 vessels	5 vessels
Pleasure Island	75	4	5 vessels	4 vessels

Listed below are the peak periods observed at each site.

- Houma - (For radar coverage of Monday - Monday, 20-27 January 1975) no peak periods
- Atchafalaya - (For radar coverage of Tuesday - Tuesday, 28 January to 4 February 1975; and Tuesday - Saturday, 13 - 15 February 1975)

  Sunday - 1415 - 1430 — 2 February
  Monday - 1400 - 1415, 1645 - 1700 — 3 February
  Friday - 1330 - 1345 — 14 February
  All other days; no peak periods

- Berwick Lock - (For radar coverage of Wednesday - Wednesday, 5 - 13 February 1975)

  Friday - 1815-1840, 2155-2220, 2325-2400
  Saturday - 0000-0200
  Sunday - 1345-1410
  Monday - 1635-1710, 1755-1810, 1635-1650, 1815-1840, 2025-2040, 2055-2120, and 2345-2400
  Tuesday - 0645-0700, 0905-0920, 1125-1210
  All other days; no peak periods

- Pleasure Island - (For radar coverage of Monday - Monday, 3 - 10 March 1975)

  Friday - 1015-1025, 1650-1700
  Saturday - 1655-1715
  Monday - 1310-1320
  All other days; no peak periods

The following observations were made based on the vessel density data collected:

- Houma - The vessel density counts were generally low - around 2-3 vessels at each count. Traffic activity was relatively uniform throughout the time coverage.

- Atchafalaya - Three of the four peak traffic periods occurred from 1330-1430 hours. A second observation from available data is the following: the vessel density is generally low from 0000 to 1000 hours; the vessel density then increases sharply around 1000 hours, and fluctuates around the mean number of vessels for the rest of the day. Saturday, 15 February 1975, is the only day when the vessel density does not follow the preceding trend. This day shows a much higher vessel density count from 0000 to 1000 hours.

- Berwick Lock - Anchored vessels account for the majority of the vessel density data. On the average, there were three vessels anchored at one time, with more or less than 3 vessels anchoring for short periods of time. The high number of peak traffic periods occurred mainly because of the high number of anchored vessels, along with usually only a couple moving vessels. A peak period from 1815-1840 occurred on Friday and Monday. A relatively uniform traffic activity (no significant changes in vessel density) existed, despite the high number of peak periods.

- Pleasure Island - Two of the four peak traffic periods occurred from 1650-1715 hours. The traffic activity remained relatively uniform throughout the time coverage.

2. Route Identification

The following definitions will apply to all route identification charts: A tug with tow is a small vessel pulling one or more vessels. Small, medium, and large ships are so defined in a comparative relationship. A small ship is further delineated as it is never larger than the small pulling vessel referred to in the tug with tow definition.

The route identification charts referred to in Section II indicate the following:

- Houma (coverage 1200-1259, Sunday, 26 January 1975)

Type of Vessel	No. of Vessels Present	Direction
	1	Intracoastal Waterway, East
Small Ship	6	Intracoastal Waterway, North
	5	Intracoastal Waterway, South

Type of Vessel	No. of Vessels Present	Direction
Medium Ship	1	Intracoastal Waterway, North
	2	Intracoastal Waterway, South
Large Ship	2	Intracoastal Waterway, South
Total No. of Vessels	17	

The land mass in the bottom middle of Houma's route identification chart overlooks the junction where the Intracoastal Waterway flowing from the west, meets Houma Navigation Canal. Above this junction, the chart depicts an even northerly and southerly flow of vessel traffic, with small ships dominating the scene.

- Atchafalaya - (coverage 1430-1700, Monday, 3 February 1975)

Type of Vessel	No. of Vessels Present	Direction
Small Ship	4	Lower Atchafalaya River, North
	6	Lower Atchafalaya River, South
Medium Ship	3	Lower Atchafalaya River, South
Large Ship	2	Lower Atchafalaya River, North
	2	Lower Atchafalaya River, South
Total No. of Vessels	17	

In a sense similar to Houma, the Atchafalaya route identification chart shows a junction where the Intracoastal Waterway from the west, meets the Lower Atchafalaya River. Eight out of a total 17 ships leave the river to enter the Intracoastal Waterway. Large ships travel northerly or southerly between the Intracoastal Waterway and the Lower Atchafalaya River. Small ships, which constitute the bulk of traffic here, show no strict preference in their routes.

- Berwick Lock - (coverage 1300-1600, Wednesday, 12 February 1975)

Type of Vessel	No. of Vessels Present	Direction
	3	Intracoastal Waterway, East
Small Ship	2	Intracoastal Waterway, Southeast
	4	Lower Atchafalaya River, West

Type of Vessel	No. of Vessels Present	Direction
	2	Stouts Pass, North
Medium Ship	2	Lower Atchafalaya River, South
	2	Intracoastal Waterway, East
	1	Lower Atchafalaya River, West
	2	Intracoastal Waterway, East
Large Ship	1	Lower Atchafalaya River, West
	2	Lower Atchafalaya River, South
Tug with Tow	1	Lower Atchafalaya River, West
Total No. of Vessels	22	

Three navigable waterways meet at this site: Stouts Pass from the north, the Intracoastal Waterway (Alternate Route) from the east, and Lower Atchafalaya River from the south. The land mass of Berwick Island lies in the western portion. The route described by the eastern and western vessel movements hosts 68% of this route identification chart's vessel traffic. Here, all vessel-types are pictured utilizing the passage in relatively equal proportions. The north/south path between Stouts Pass and the Lower Atchafalaya River is similarly representative of the various types of vessel traffic, though its vessel density is comparatively lower.

- Pleasure Island - (coverage 1210-1700, Sunday, 9 March 1975

Type of Vessel	No. of Vessels Present	Direction
Small Ship	1	Port Arthur Canal, South
	6	Sabine Neches Canal, North
Medium Ship	3	Port Arthur Canal, South
	1	Intracoastal Waterway, West
	1	Port Arthur Canal, South
Large Ship	10	Sabine Neches Canal, North
	1	West Basin, North
	1	Intracoastal Waterway, West
Total No. of Vessels	24	

Out of four possible routes, one, the northerly trip up Sabine Neches Canal, attracts the greatest traffic. The three other waterways that meet with Sabine Neches Canal are the West Basin, the Intracoastal Waterway, and Port Arthur Canal. The curious geometric shaped gap in the midst of this junction is the cable area, circumnavigated by all vessels. Unlike the medium and large ships, no small vessels are seen using the West Basin or the Intracoastal Waterway. Vessel traffic here is dominated by large ships, the majority of which travel north in the Sabine Neches Canal.

3. Vessel Speed

Observed speeds on the Gulf Coast ICW had the following ranges:

- Houma 1 - 34 knots (9.2 knot average)
- Atchafalaya 3 - 28 knots (8.9 knot average)
- Berwick Lock 1 - 15 knots (6.1 knot average)
- Pleasure Island 1 - 11 knots (5.7 knot average)

The following data represents the fastest, slowest, and average speed (given in knots) of each type of vessel present - according to site.

- Houma

Type of Vessel	No. of Vessels Present	Fastest	Slowest	Average
Small ship	30	34	2	13.7
Medium ship	26	11	3	6.3
Large ship	13	8	1	4.7
Total	69			

- Atchafalaya

Type of Vessel	No. of Vessels Present	Fastest	Slowest	Average
Small ship	26	28	5	10.0
Medium ship	11	11	4	8.4
Large ship	11	11	3	7.1
Tug with Tow	1	4	4	-
Total	49			

- Berwick Lock

Type of Vessel	No. of Vessels Present	Fastest	Slowest	Average
Small ship	22	22	4	7.6
Medium ship	14	13	2	5.1
Large ship	19	9	1	5.2
Tug with Tow	2	6	3	4.5
Total	57			

- Pleasure Island

Type of Vessel	No. of Vessels Present	Fastest	Slowest	Average
Small ship	17	11	5	6.6
Medium ship	13	8	2	5.0
Large ship	20	10	3	5.3
Total	50			

The following data presents different speeds for each type of vessel, at each site:

Small Ship	No. of Vessels Present	Fastest	Slowest	Average
Houma	30	34	2	13.7
Atchafalaya	26	28	5	10.0
Berwick Lock	22	22	4	7.6
Pleasure Island	17	11	5	6.6
	Average	23.7	4.0	9.5

Medium Ship	No. of Vessels Present	Fastest	Slowest	Average
Houma	26	11	3	6.3
Atchafalaya	11	11	4	8.4
Berwick Lock	14	13	2	5.1
Pleasure Island	13	8	2	5.0
	Average	10.7	2.7	6.2

Large Ship	No. of Vessels Present	Fastest	Slowest	Average
Houma	13	8	1	4.7
Atchafalaya	11	11	3	7.1
Berwick Lock	19	9	1	5.2
Pleasure Island	20	10	3	5.3
	Average	9.5	2.0	5.6

Tug with Tow	No. of Vessels Present	Fastest	Slowest	Average
Atchafalaya	1	4	4	-
Berwick Lock	2	6	3	4.5

4. Close Encounters

The observed rates of close encounters are as follows:

Houma	50 in 3 hours (16.7) out of 56 total encounters
Atchafalaya	50 in 3¼ hours (15.4) out of 67 total encounters
Berwick Lock	21 in 24 hours (0.9) out of 28 total encounters
Pleasure Island	19 in 24 hours (0.8) out of 31 total encounters

The numbers in parenthesis are close encounters per hour. Below, the close encounters observed are categorized in three ways: vessel-type combinations, the total number of encounters of each combination, and their range in yards. The manner of approach is also given (P = Passing, O = Overtaking, C = Crossing). Radar resolution limits the accuracy of measured distances.

- Houma (3 hours coverage)

No. & Manner of Approach P	O	C	Type of Vessel Combination	No. of Combinations Observed	Range of Close Encounters (Yards)
15	6	1	2 small ships	22	< 19 - 100
3	1	-	2 medium ships	4	100
3	-	-	2 large ships	3	30 - 100
4	9	2	1 small ship and 1 medium ship	15	< 23 - 100
1	4	-	1 small ship and 1 large ship	5	< 29 - 100
1	-	-	1 medium ship and 1 large ship	1	100
27	20	3	Totals	50	

- Atchafalaya (3¼ hours coverage)

No. & Manner of Approach P	O	C	Type of Vessel Combination	No. of Combinations Observed	Range of Close Encounters (Yards)
11	3	-	2 small ships	14	< 50 - 200
1	-	-	2 medium ships	1	150
6	-	-	2 large ships	6	< 100 - 200
10	2	-	1 small ship and 1 medium ship	12	< 100 - 200
11	-	-	1 small ship and 1 large ship	11	< 100 - 200
6	-	-	1 medium ship and 1 large ship	6	100
45	5	0	Totals	50	

- Berwick Lock (24 hour coverage)

No. & Manner of Approach P	O	C	Type of Vessel Combination	No. of Combinations Observed	Range of Close Encounters (Yards)
3	-	-	2 small ships	3	50
1	-	-	2 medium ships	1	48
6	-	-	2 large ships	6	45 - 150
1	-	1	1 small ship and 1 medium ship	2	55 - 80
3	1	-	1 small ship and 1 large ship	4	50 - 100
4	-	-	1 medium ship and 1 large ship	4	<38 - 113
1	-	-	1 medium ship and 1 tug	1	30
19	1	1	Totals	21	

- Pleasure Island (24 hour coverage)

No. & Manner of Approach P	O	C	Type of Vessel Combination	No. of Combinations Observed	Range of Close Encounters (Yards)
2	-	-	2 small ships	2	50 - 75
-	-	-	2 medium ships	-	-
10	3	-	2 large ships	13	31 - 98
1	-	1	1 small ship and 1 medium ship	2	56 - 63
1	-	-	1 small ship and 1 large ship	1	84
-	1	-	1 medium ship and 1 large ship	1	50
14	4	1	Totals	19	

5. Channel Utilization

Channel 13 utilization exhibited the following peak and average percentages:

Site	Day of Coverage	Peak (%)	Time of Peak	Average (%)
Houma	Tuesday, 21 January, 1975	36	0014 - 0030	11
Atchafalaya	Friday, 31 January, 1975	37	1200 - 1215	7
Berwick Lock	Thursday, 6 February, 1975	30	2000 - 2015	6
Pleasure Island	Wednesday, 5 March, 1975	26	1430 - 1445	3

6. Message Activity.

Message activity exhibited the following peak and average values for channel 13:

Site	Day of Coverage	Peak No. of Messages	Time of Peak	Average No. of Messages
Houma	Tuesday, 21 January 1975	121	0700 - 0715	37
Atchafalaya	Friday, 31 January, 1975	113	1215 - 1230	23
Berwick Lock	Thursday, 6 February, 1975	244	1630 - 1645	48
Pleasure Island	Wednesday, 5 March, 1975	88	1600 - 1615 and 1715 - 1730	14

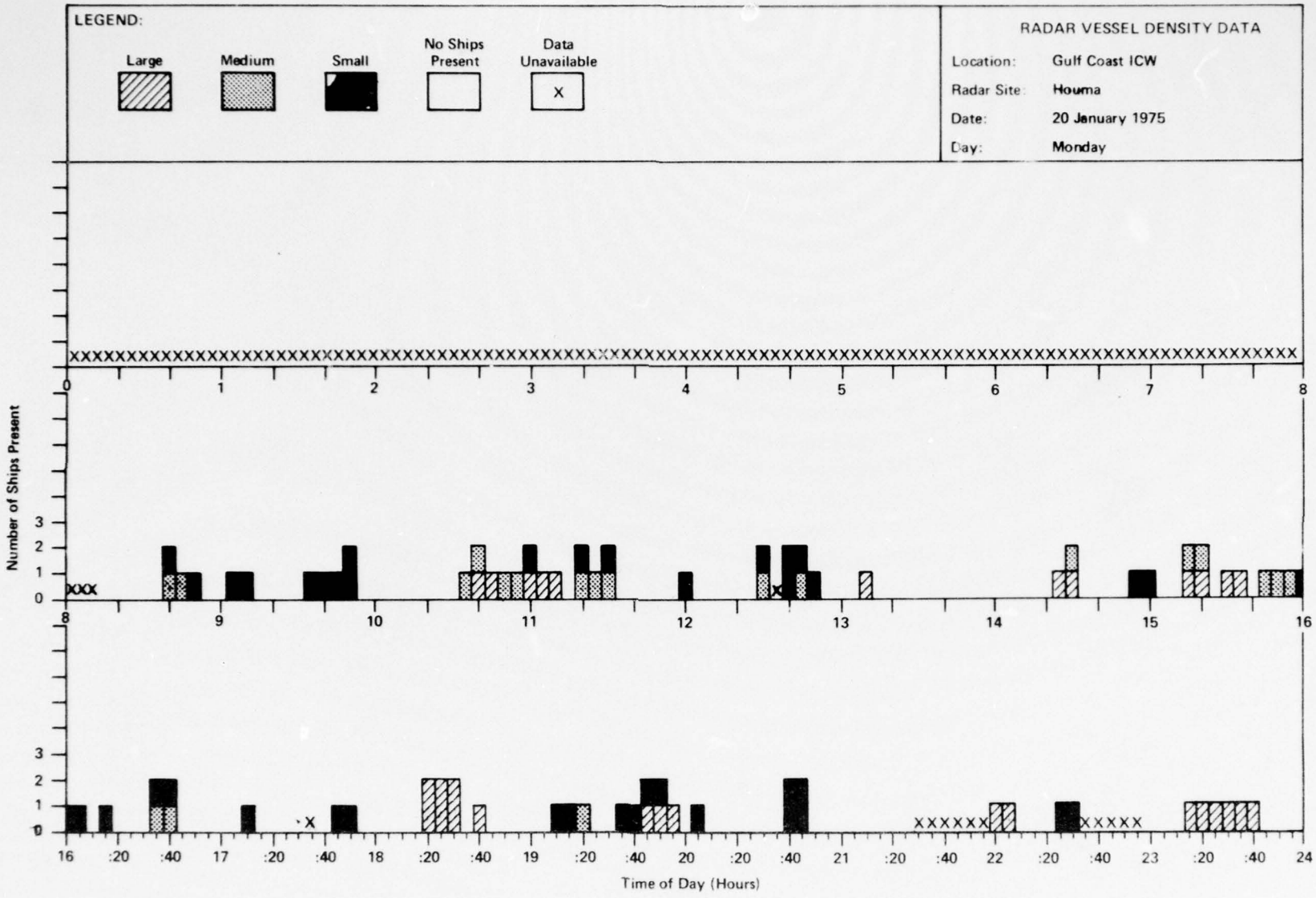
7. Channel Efficiency.

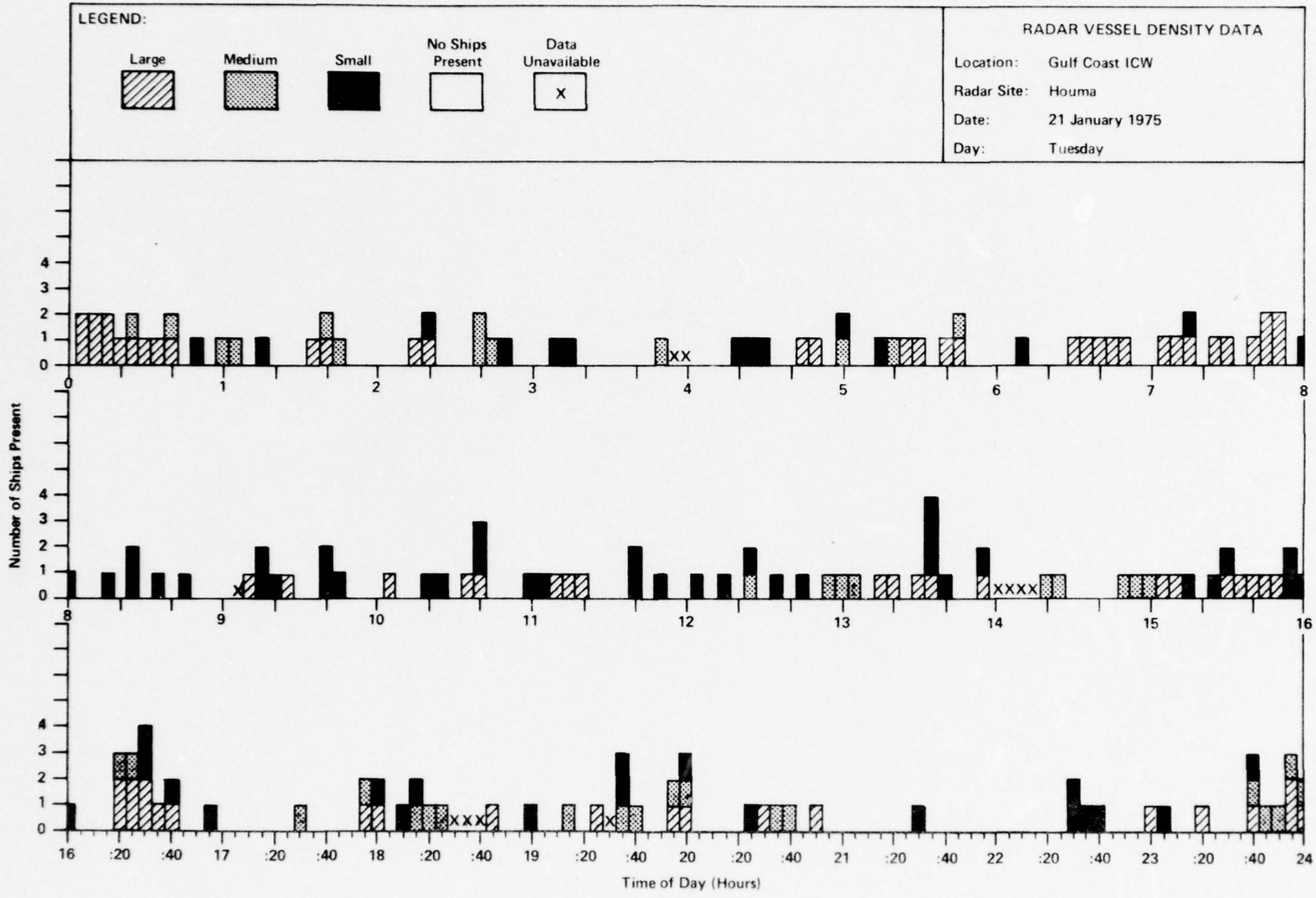
Channel efficiency data are as follows:

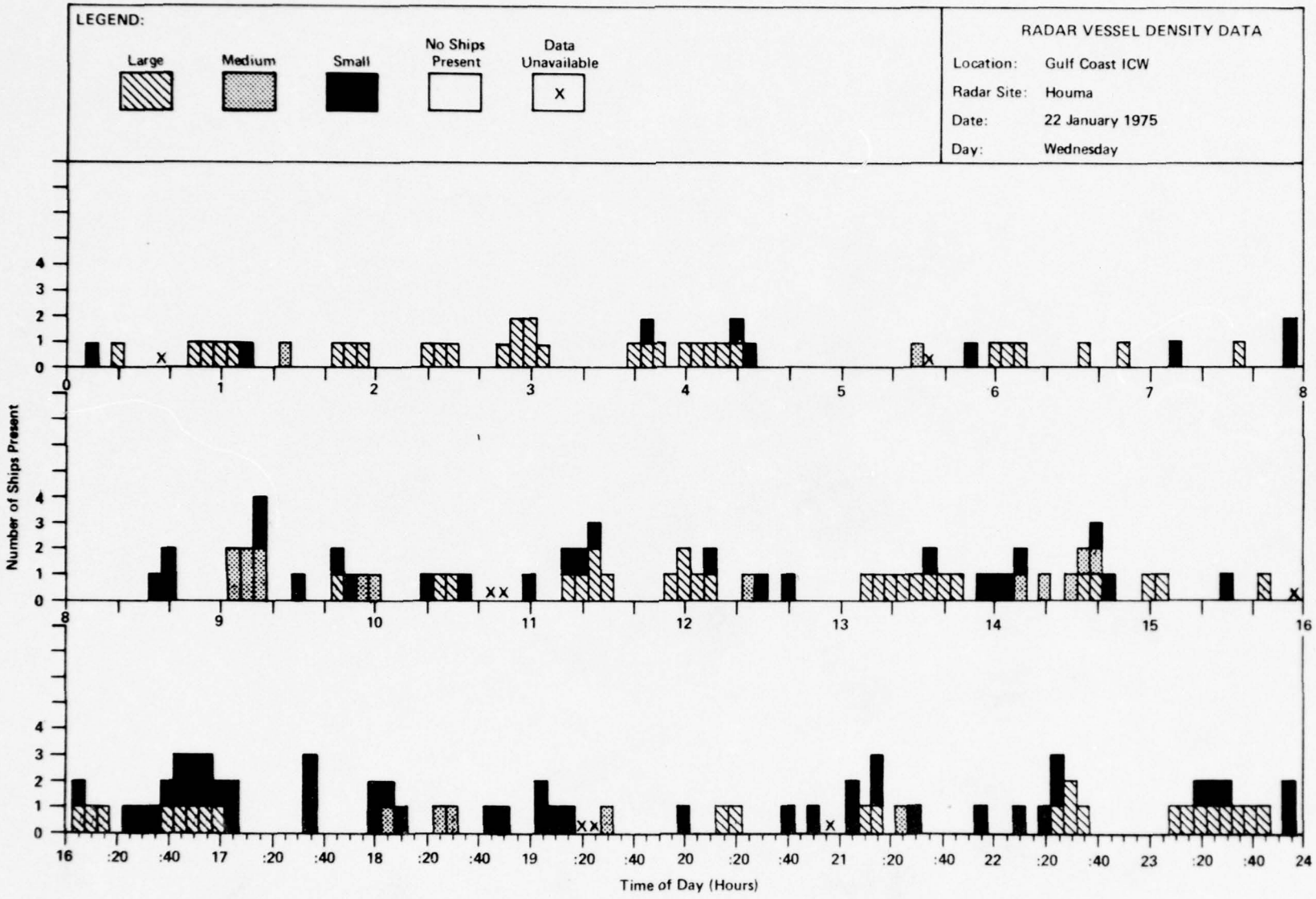
Site	Peak (%)	Average (%)
Houma	100	68
Atchafalaya	100	70
Berwick Lock	100	42
Pleasure Island	100	61

II. DATA

2.1 DATA FROM HOUMA


LEGEND:
Large
Medium
Small
No Ships Present
Data Unavailable
X
RADAR VESSEL DENSITY DATA
Location: Gulf Coast ICW
Radar Site: Houma
Date: 20 January 1975
Day: Monday
Number of Ships Present
Time of Day (Hours)


LEGEND:
Large
Medium
Small
No Ships Present
Data Unavailable
X
RADAR VESSEL DENSITY DATA
Location: Gulf Coast ICW
Radar Site: Houma
Date: 21 January 1975
Day: Tuesday
Number of Ships Present
Time of Day (Hours)


LEGEND:
Large
Medium
Small
No Ships Present
Data Unavailable
X
RADAR VESSEL DENSITY DATA
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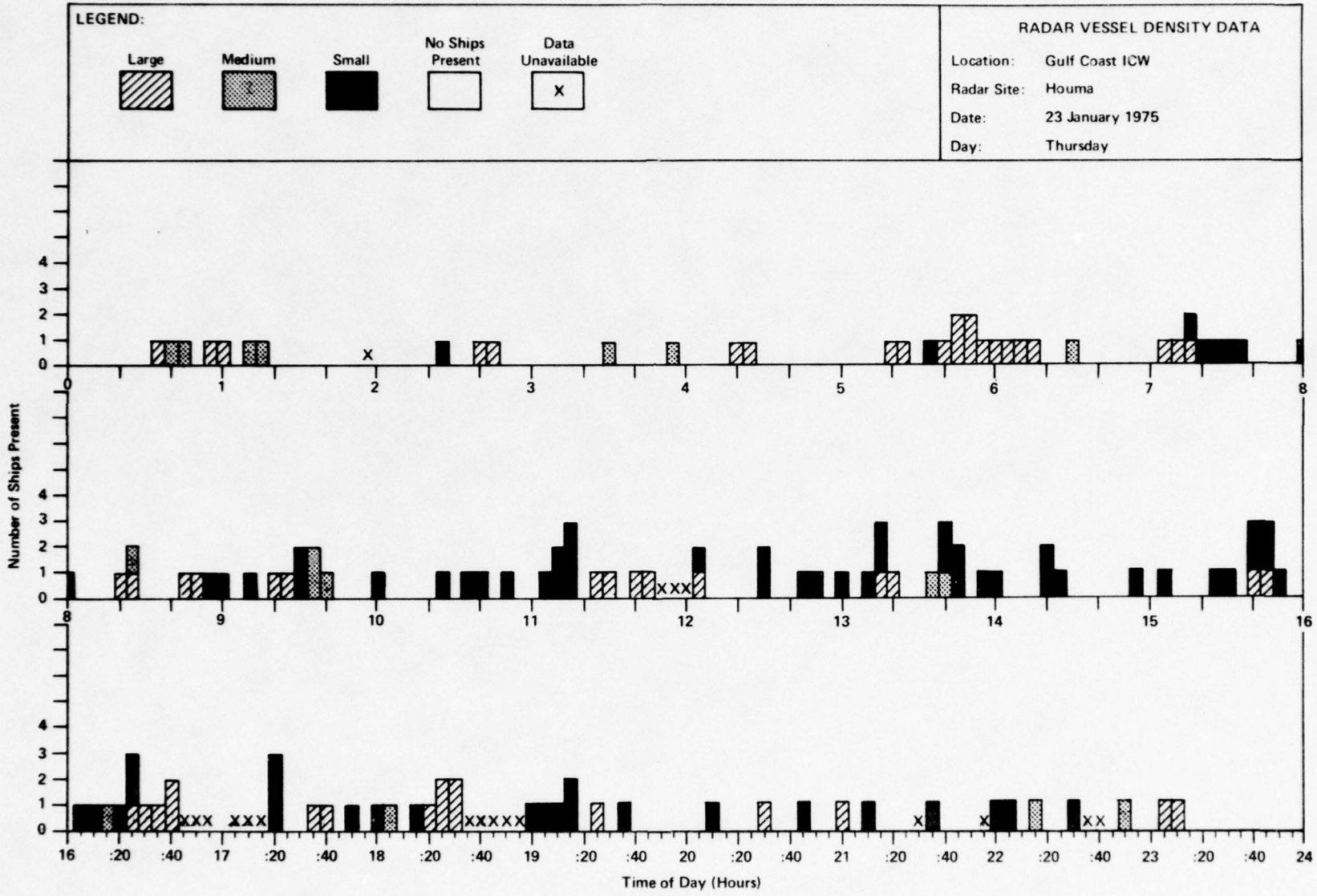
Radar Site: Houma
Date: 22 January 1975
Day: Wednesday
Number of Ships Present
Time of Day (Hours)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Large
Medium
Small
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Data Unavailable
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RADAR VESSEL DENSITY DATA
Location: Gulf Coast ICW
Radar Site: Houma
Date: 23 January 1975
Day: Thursday
Number of Ships Present
Time of Day (Hours)
0 1 2 3 4 5 6 7 8
8 9 10 11 12 13 14 15 16
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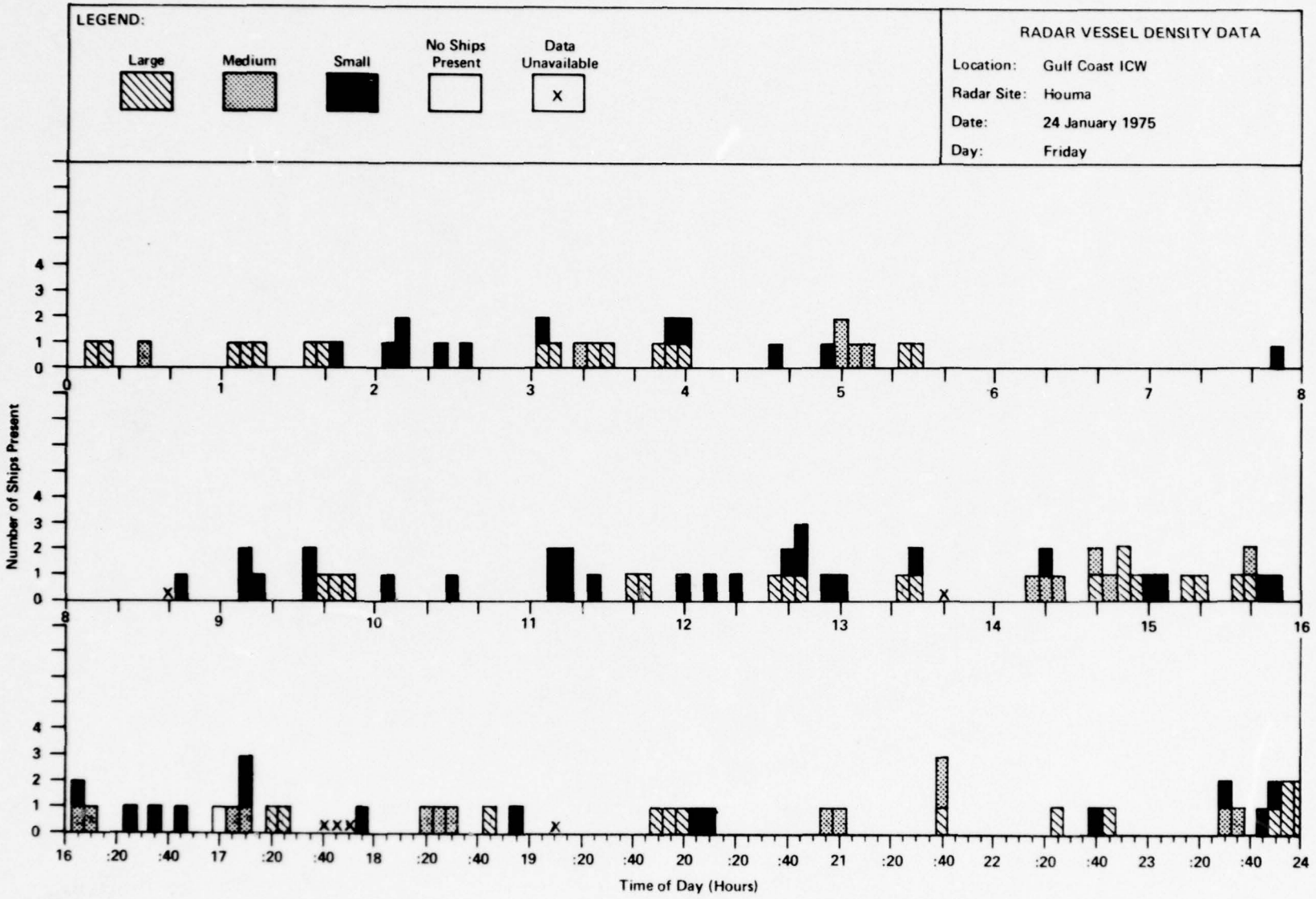
LEGEND:
Large
Medium
Small
No Ships Present
Data Unavailable
X
RADAR VESSEL DENSITY DATA
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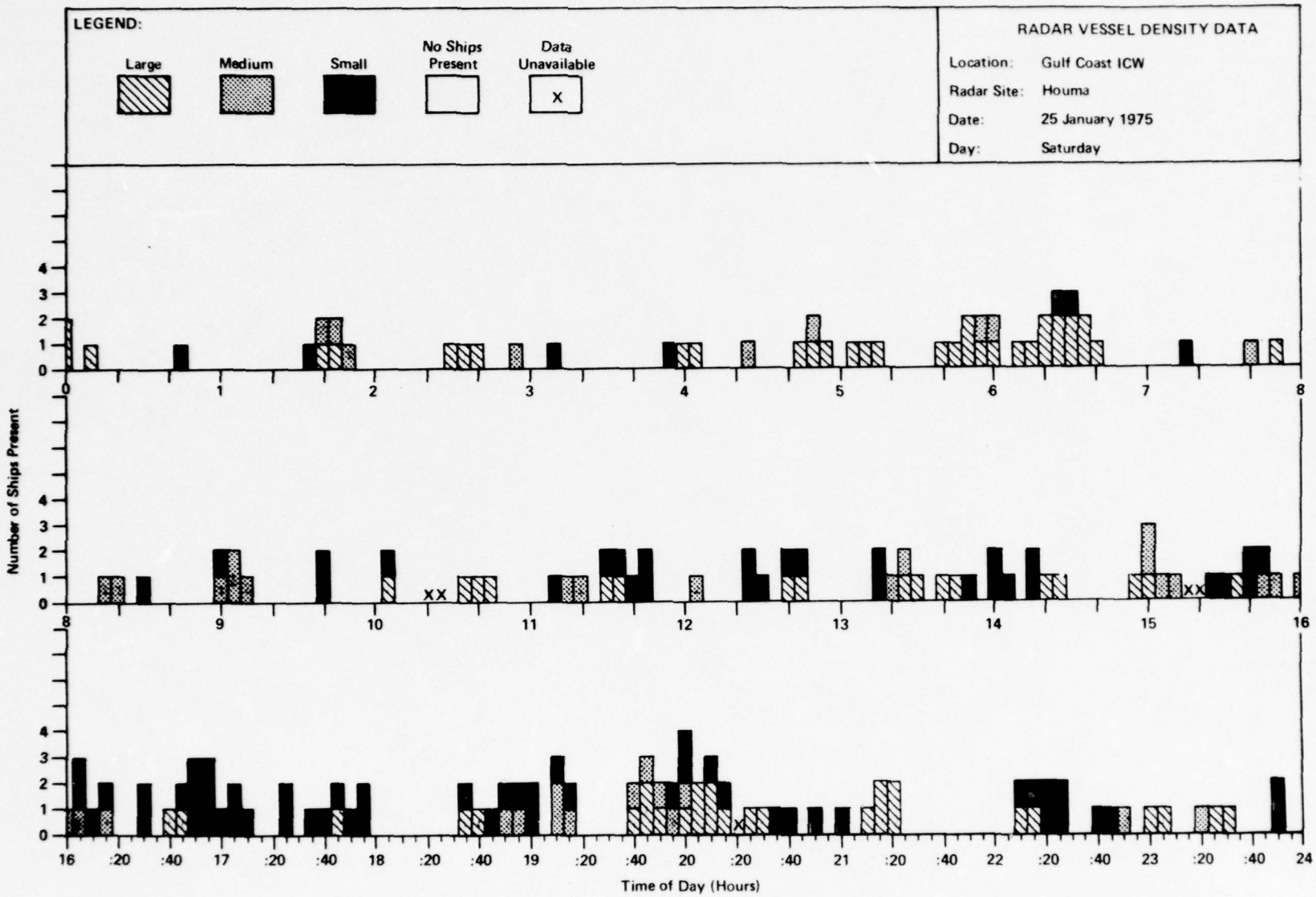
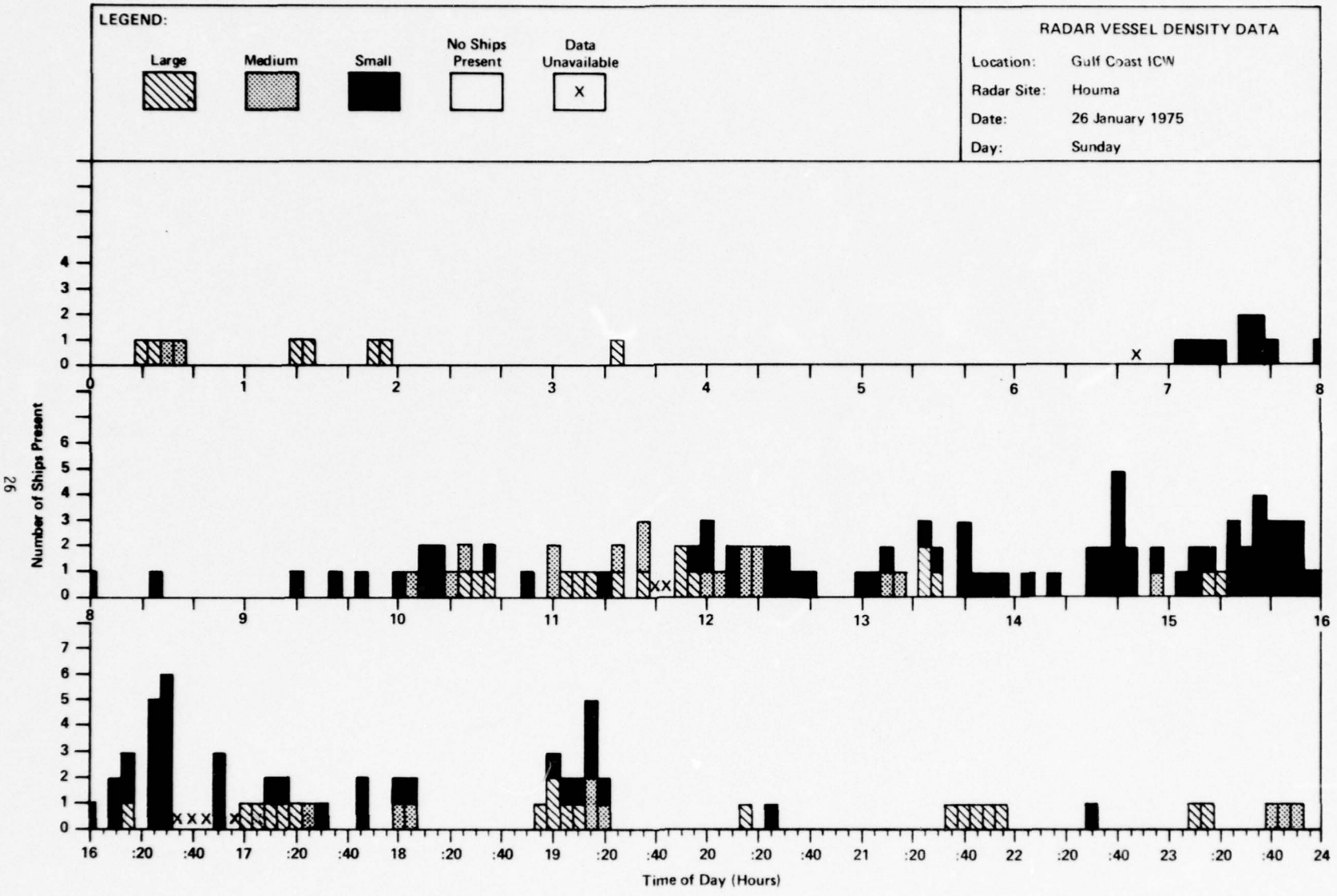
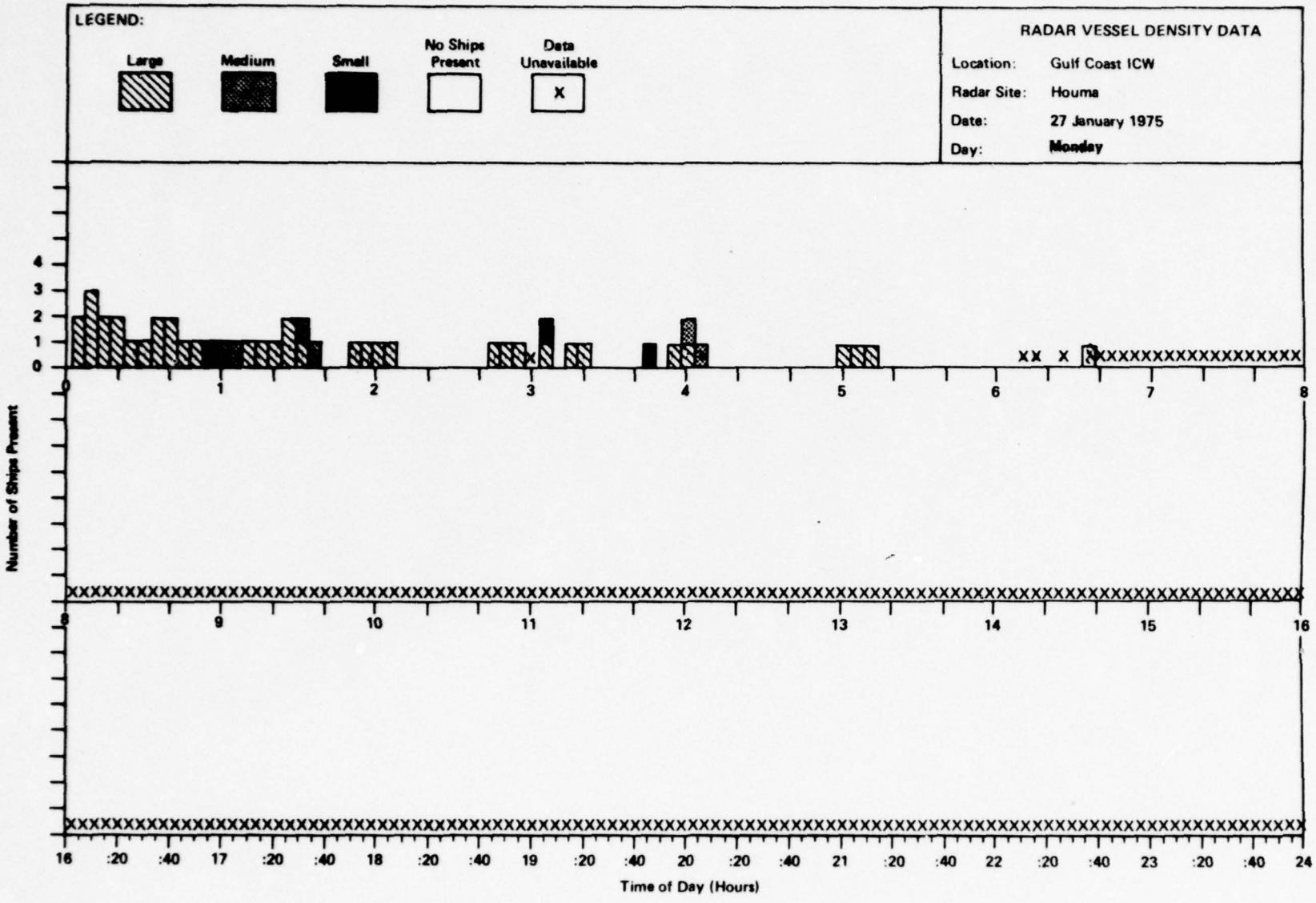
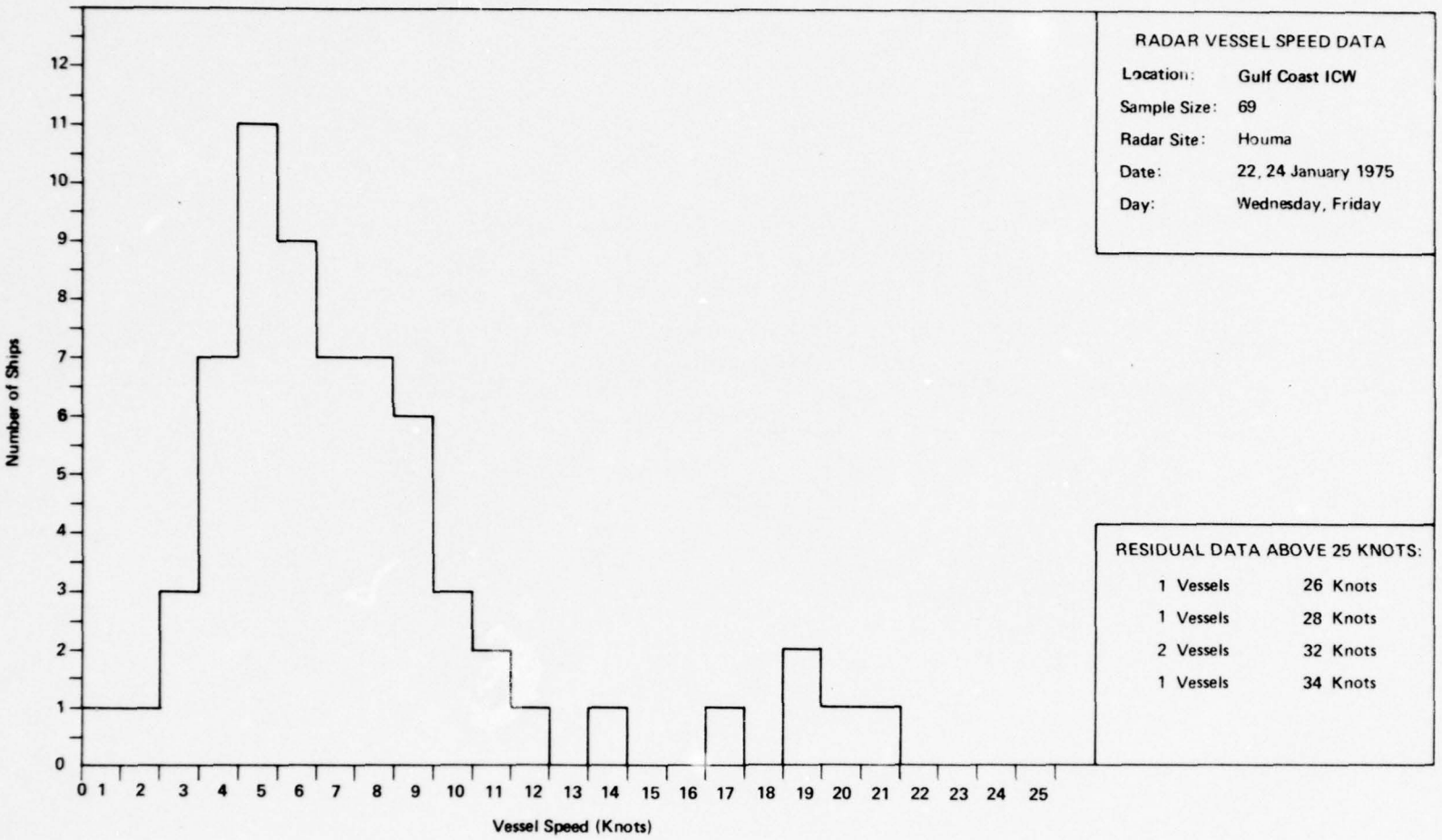
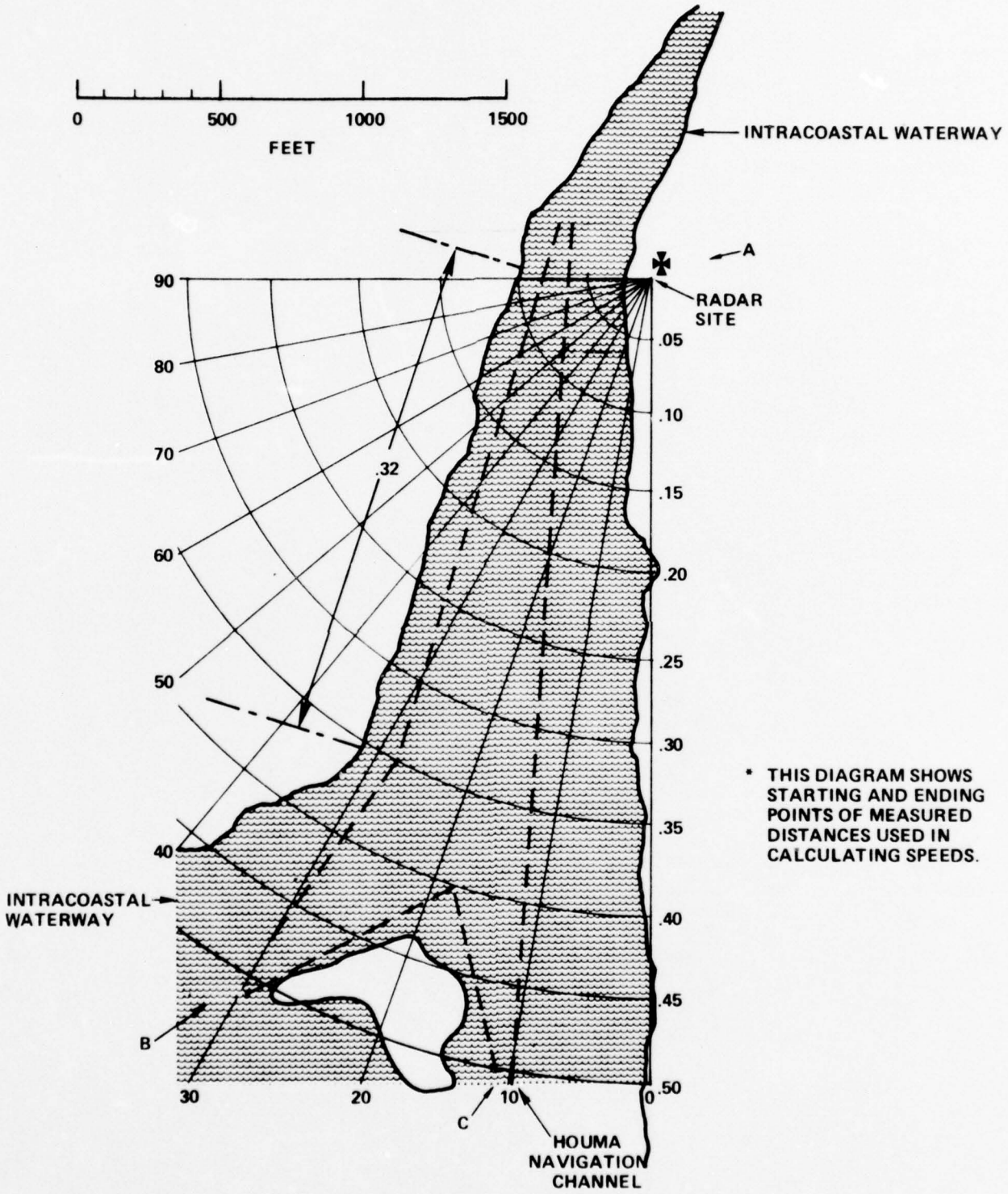
Radar Site: Houma
Date: 24 January 1975
Day: Friday
Number of Ships Present
Time of Day (Hours)


LEGEND:
Large
Medium
Small
No Ships Present
Data Unavailable
X
RADAR VESSEL DENSITY DATA
Location: Gulf Coast ICW
Radar Site: Houma
Date: 25 January 1975
Day: Saturday
Number of Ships Present
Time of Day (Hours)
0 1 2 3 4 5 6 7 8
8 9 10 11 12 13 14 15 16
16 :20 :40 17 :20 :40 18 :20 :40 19 :20 :40 20 :20 :40 21 :20 :40 22 :20 :40 23 :20 :40 24


LEGEND:
Large
Medium
Small
No Ships Present
Data Unavailable
X
RADAR VESSEL DENSITY DATA
Location: Gulf Coast ICW
Radar Site: Houma
Date: 26 January 1975
Day: Sunday
Number of Ships Present
Time of Day (Hours)


LEGEND:
Large
Medium
Small
No Ships Present
Data Unavailable
X
RADAR VESSEL DENSITY DATA
Location: Gulf Coast ICW
Radar Site: Houma
Date: 27 January 1975
Day: Monday
Number of Ships Present
0
1
2
3
4
0 1 2 3 4 5 6 7 8
8 9 10 11 12 13 14 15 16
16 :20 :40 17 :20 :40 18 :20 :40 19 :20 :40 20 :20 :40 21 :20 :40 22 :20 :40 23 :20 :40 24
Time of Day (Hours)


RADAR VESSEL SPEED DATA
Location: Gulf Coast ICW
Sample Size: 69
Radar Site: Houma
Date: 22, 24 January 1975
Day: Wednesday, Friday
RESIDUAL DATA ABOVE 25 KNOTS:
1 Vessels 26 Knots
1 Vessels 28 Knots
2 Vessels 32 Knots
1 Vessels 34 Knots
Number of Ships
0 1 2 3 4 5 6 7 8 9 10 11 12
Vessel Speed (Knots)
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25



SPEED CALCULATION TIMING POINTS FOR HOUMA*

SPEED DATA
FOR
HOUMA

Vessel No.	Vessel Size	Average Speed in Knots	Direction *	Day	Time Hour/Minute	
1	small	7	C-A	22 January 1975 Wednesday	10	58
2	large	1	B-C		11	16
3	medium	3	A-C		11	17
4	large	4	A-B		11	24
5	small	21	B-A		11	32
6	large	5	B-A		11	52
7	large	4	B-A		11	59
8	small	7	A-C		12	08
9	medium	5	A-C		12	24
10	small	8	A-B		12	29
11	small	9	C-A		12	36
12	small	14	A-B		12	47
13	small	9	C-A		13	31
14	small	17	B-A		13	54
15	small	8	B-A		13	57
16	small	19	B-A		14	04
17	medium	6	A-B		14	08
18	small	10	B-A		14	09
19	medium	7	B-A		14	17
20	medium	4	A-C		14	31
21	large	8	B-A		14	37
22	small	3	B-C		14	37
23	small	20	A-C		14	45
24	large	4	B-A		14	59
25	small	9	B-A		15	29
26	small	12	C-A		15	41
27	medium	5	B-A		15	42

* See Figure "Speed Calculation Timing Points for Houma"

SPEED DATA
FOR
HOUMA (Cont'd)

Vessel No.	Vessel Size	Average Speed in Knots	Direction *	Day	Time Hour/Minute	
28	medium	7	A-C	24 January 1975 Friday	14	16
29	small	19	B-A		14	16
30	small	9	C-A		14	17
31	medium	7	A-B		14	23
32	medium	6	B-A		14	37
33	medium	5	B-A		14	38
34	medium	5	C-A		14	47
35	large	5	A-C		14	53
36	small	28	A-B		15	05
37	large	5	B-A		15	12
38	large	5	A-B		15	36
39	medium	8	A-C		15	40
40	medium	10	C-A		15	41
41	small	32	B-A		15	48
42	small	11	C-A		16	04
43	medium	5	A-C		16	08
44	small	32	B-A		16	21
45	small	7	A-B		16	25
46	small	34	C-A		16	34
47	small	26	A-B		16	41
48	small	2	B-C		16	54
49	medium	3	A-B		17	06
50	small	6	A-B		17	10
51	large	6	A-B		17	10
52	medium	8	C-A		18	19
53	medium	9	C-A		18	28
54	medium	6	C-A		18	42

* See Figure "Speed Calculation Timing Points for Houma"

SPEED DATA
FOR
HOUMA (Cont'd)

Vessel No.	Vessel Size	Average Speed in Knots	Direction *	Day	Time Hour/Minute	
55	small	9	C-A	24 January 1975 Friday	18	51
56	large	4	A-B		19	50
57	medium	7	B-A		20	05
58	medium	6	A-C		20	58
59	medium	5	C-A		21	35
60	medium	4	B-C		21	39
61	medium	8	C-A		21	39
62	small	6	C-B		21	53
63	large	6	B-C		22	07
64	medium	8	C-A		22	21
65	medium	5	A-B		22	38
66	small	10	C-B		22	41
67	medium	11	C-B		22	44
68	small	6	C-A		22	45
69	large	4	A-B		23	55

* See Figure "Speed Calculation Timing Points for Houma"

CLOSE ENCOUNTER
FOR
HOUMA

No.	Day	Time Hour/Minute		Distance Yards	Size	Manner of Approach*
1	Sunday	11	47	30	2 large	P
2	26 January 1975	11	56	<100	1 large, 1 small	P
3		11	57	33	2 small	P
4		11	58	<100	2 large	P
5		11	59	41	1 medium, 1 small	P
6		11	59	<100	2 medium	P
7		12	01	<100	2 medium	P
8		12	01	<100	1 medium, 1 small	P
9		12	01	<100	2 small	P
10		12	01	<100	2 small	P
11		12	01	<100	2 small	O
12		12	02	<100	1 medium, 1 small	O
13		12	02	<100	1 medium, 1 small	O
14		12	02	<100	2 small	O
15		12	11	<100	1 medium, 1 small	P
16		12	12	<100	2 medium	P
17		12	17	<100	1 medium, 1 small	O
18		12	17	<100	1 medium, 1 small	O
19		12	17	<100	2 small	O
20		12	17	<100	1 medium, 1 small	O
21		12	17	<100	1 medium, 1 small	O
22		12	17	<100	2 small	O
23		12	18	48	1 large, 1 small	O
24		12	19	<23	1 medium, 1 small	O
25		12	19	39	1 large, 1 small	O
26		12	26	36	2 small	P
27		12	35	<100	2 small	P

*P = Passing
O = Overtaking
C = Crossing

< = less than

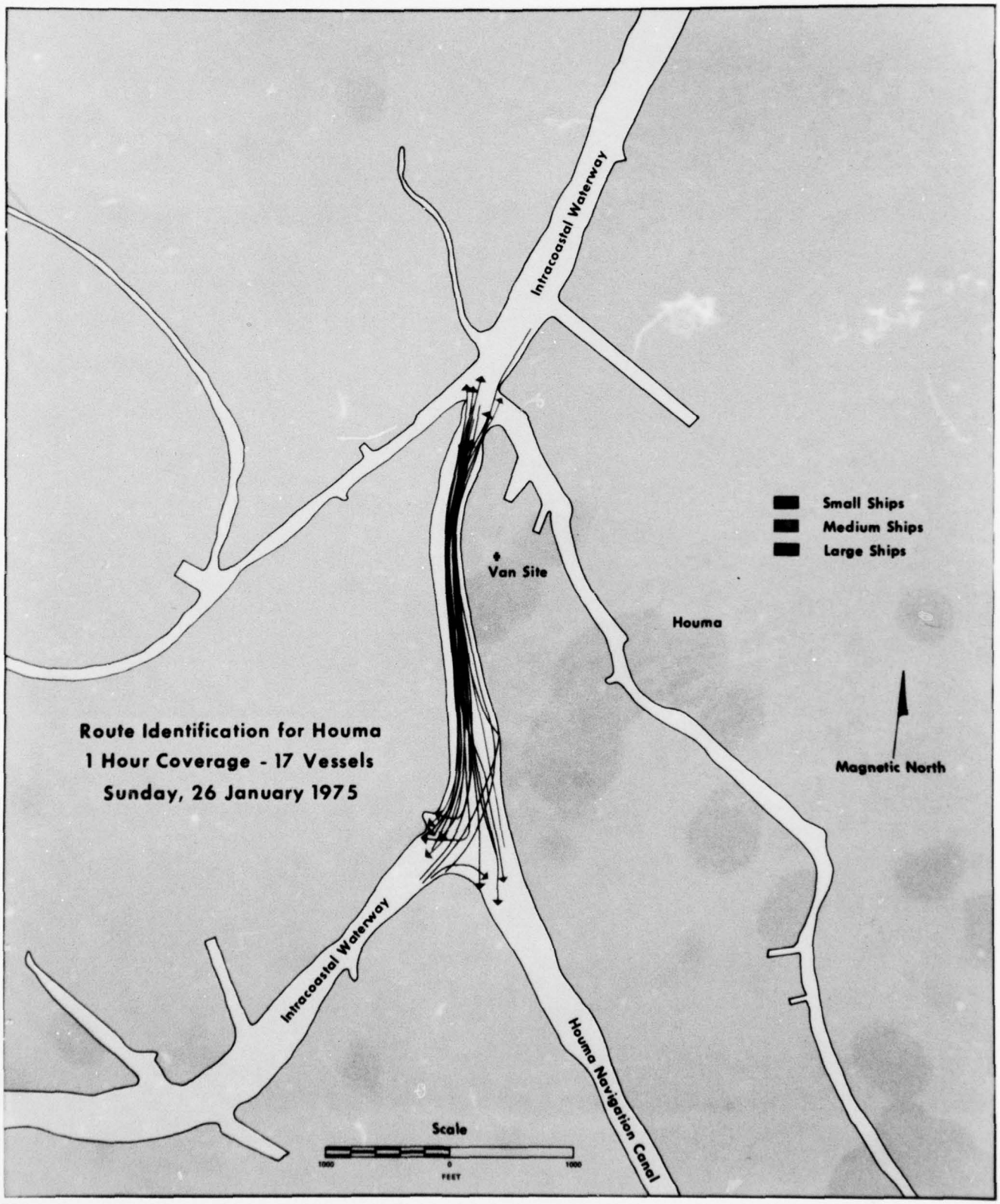
CLOSE ENCOUNTER
FOR
HOUMA (Cont'd)

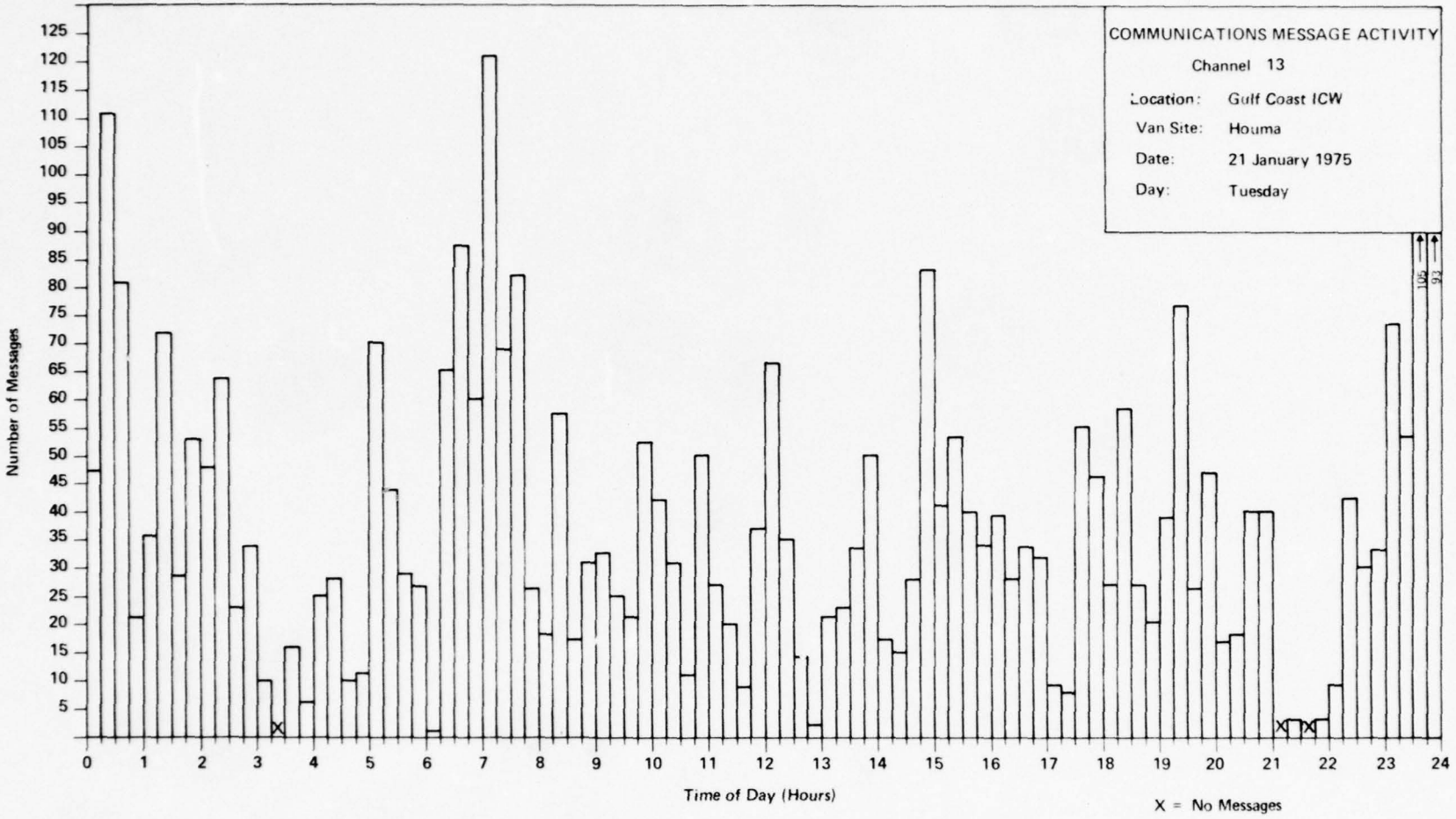
No.	Day	Time Hour	Time Minute	Distance Yards	Size	Manner of Approach*
28	Sunday 26 January 1975	12	56	<100	2 small	O
29		12	56	25	2 small	P
30		12	57	29	2 small	P
31		13	10	<21	2 small	P
32		13	16	69	2 small	P
33		13	16	100	1 medium, 1 small	C
34		13	24	<29	1 large, 1 small	O
35		13	24	33	1 large, 1 small	O
36		13	25	34	2 large	P
37		13	28	<100	1 large, 1 medium	P
38		13	39	<19	2 small	O
39		13	44	40	1 medium, 1 small	O
40		13	44	<100	2 small	P
41		13	44	<100	1 medium, 1 small	P
42		13	45	36	2 small	P
43		13	45	<100	2 medium	O
44		13	46	<100	1 medium, 1 small	O
45		14	08	<100	2 small	P
46		14	08	<100	2 small	P
47		14	13	49	1 medium, 1 small	C
48		14	13	36	2 small	C
49		14	27	<100	2 small	P
50		14	29	58	2 small	P

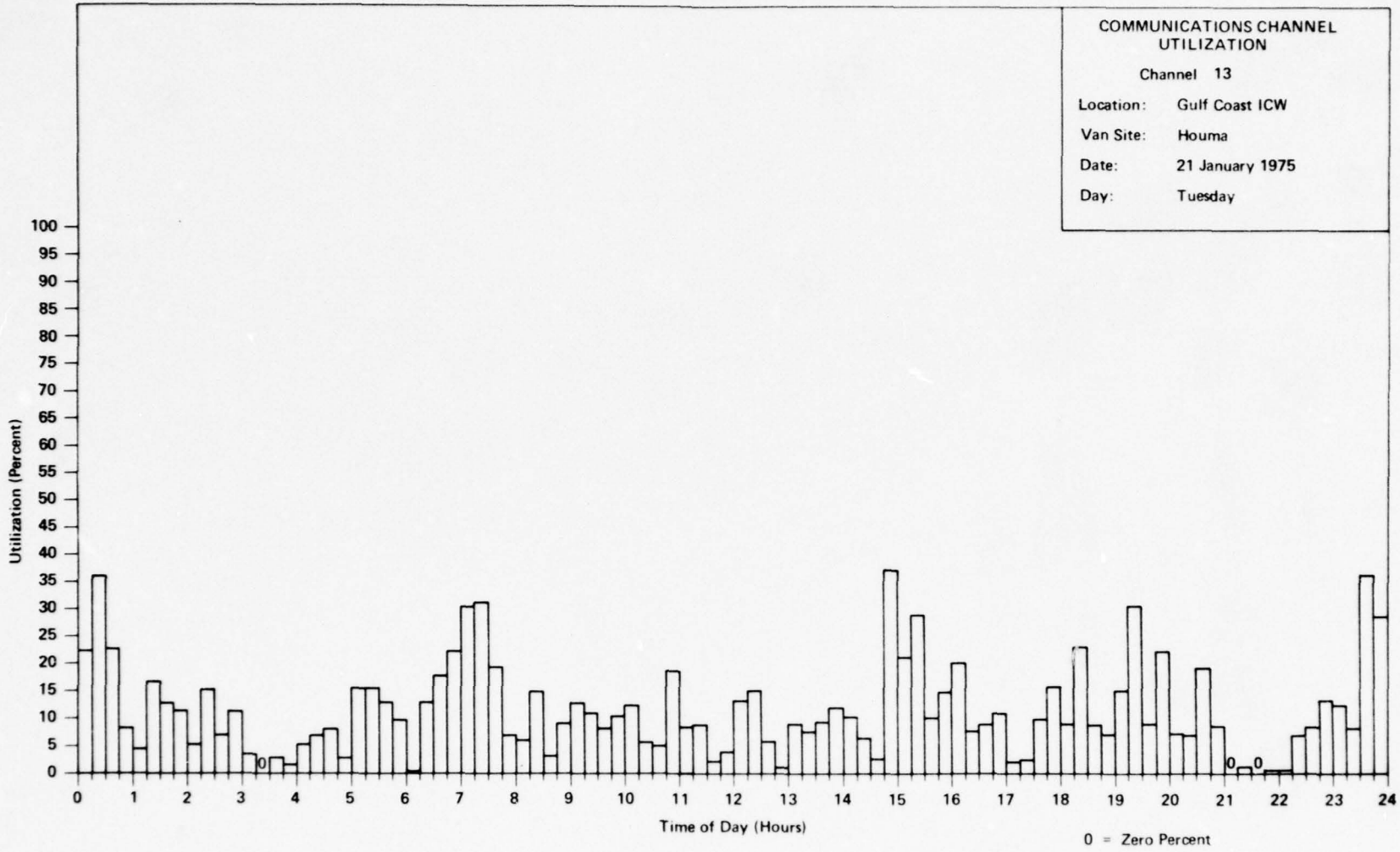
50 close encounters out of 56 total encounters in 3 hours coverage.

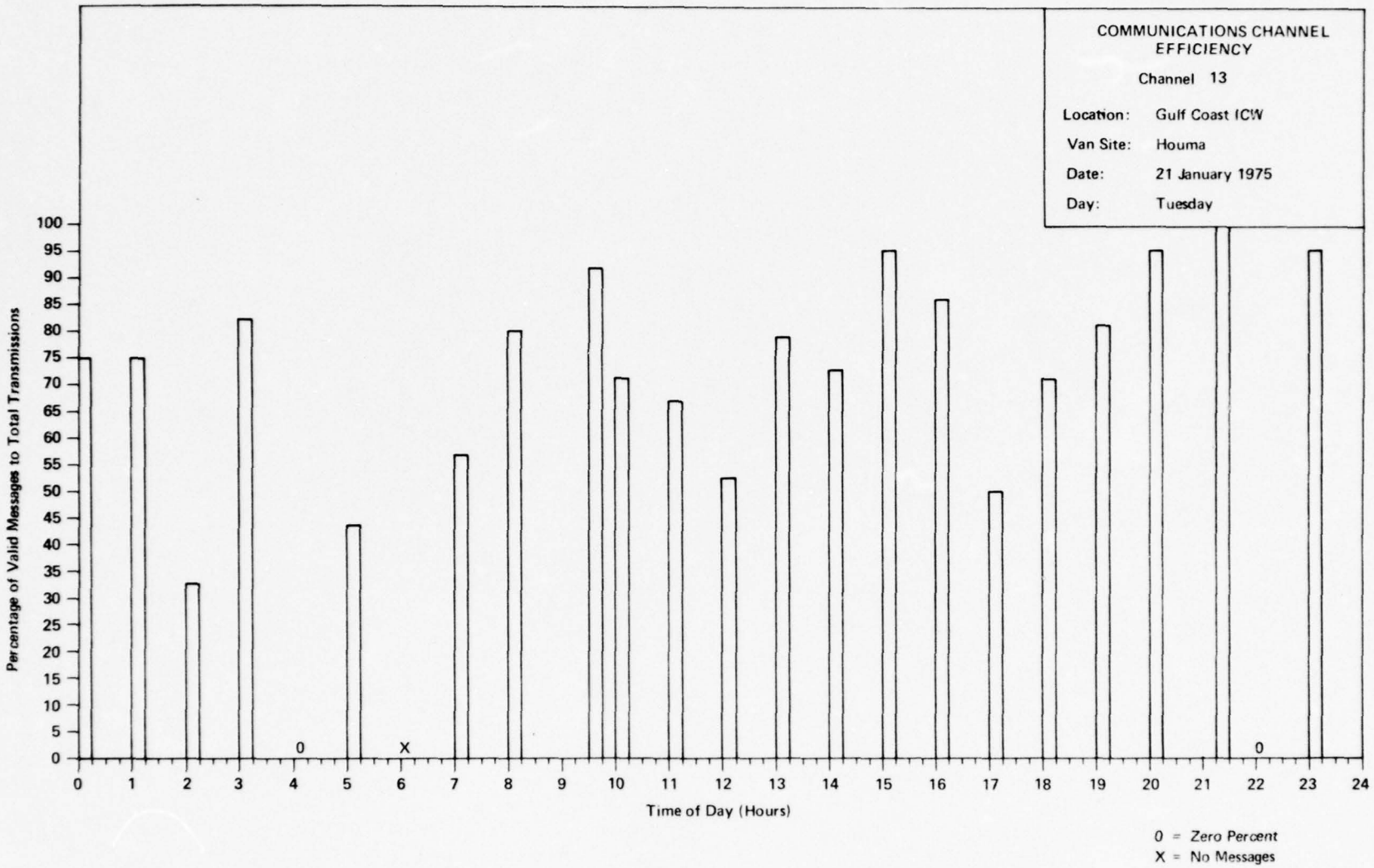
*P = Passing
O = Overtaking
C = Crossing

< = less than

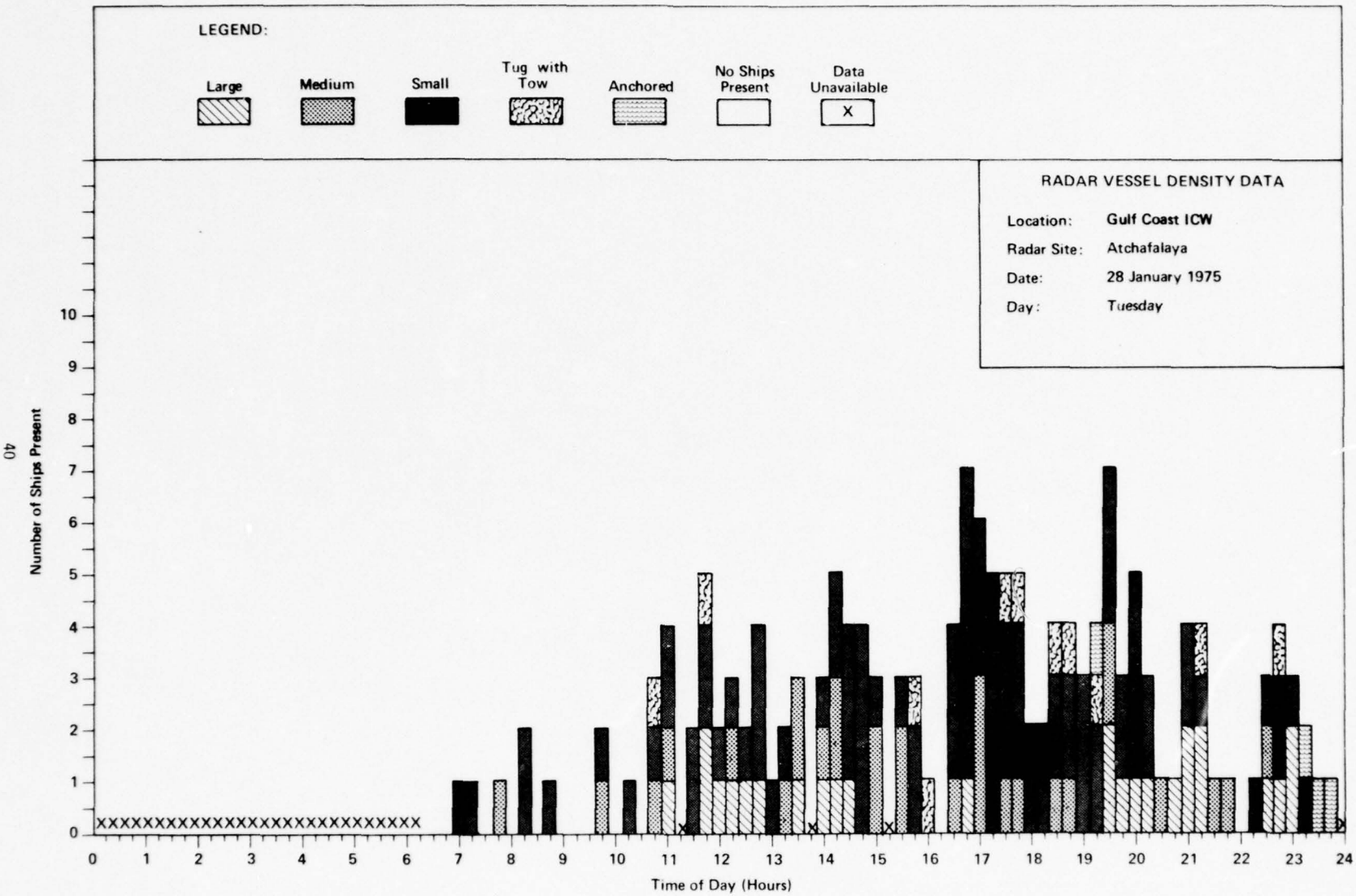

Intracoastal Waterway
Small Ships
Medium Ships
Large Ships
Van Site
Houma
Route Identification for Houma
1 Hour Coverage - 17 Vessels
Sunday, 26 January 1975
Magnetic North
Intracoastal Waterway
Houma Navigation Canal
Scale
1000
0
1000
FEET

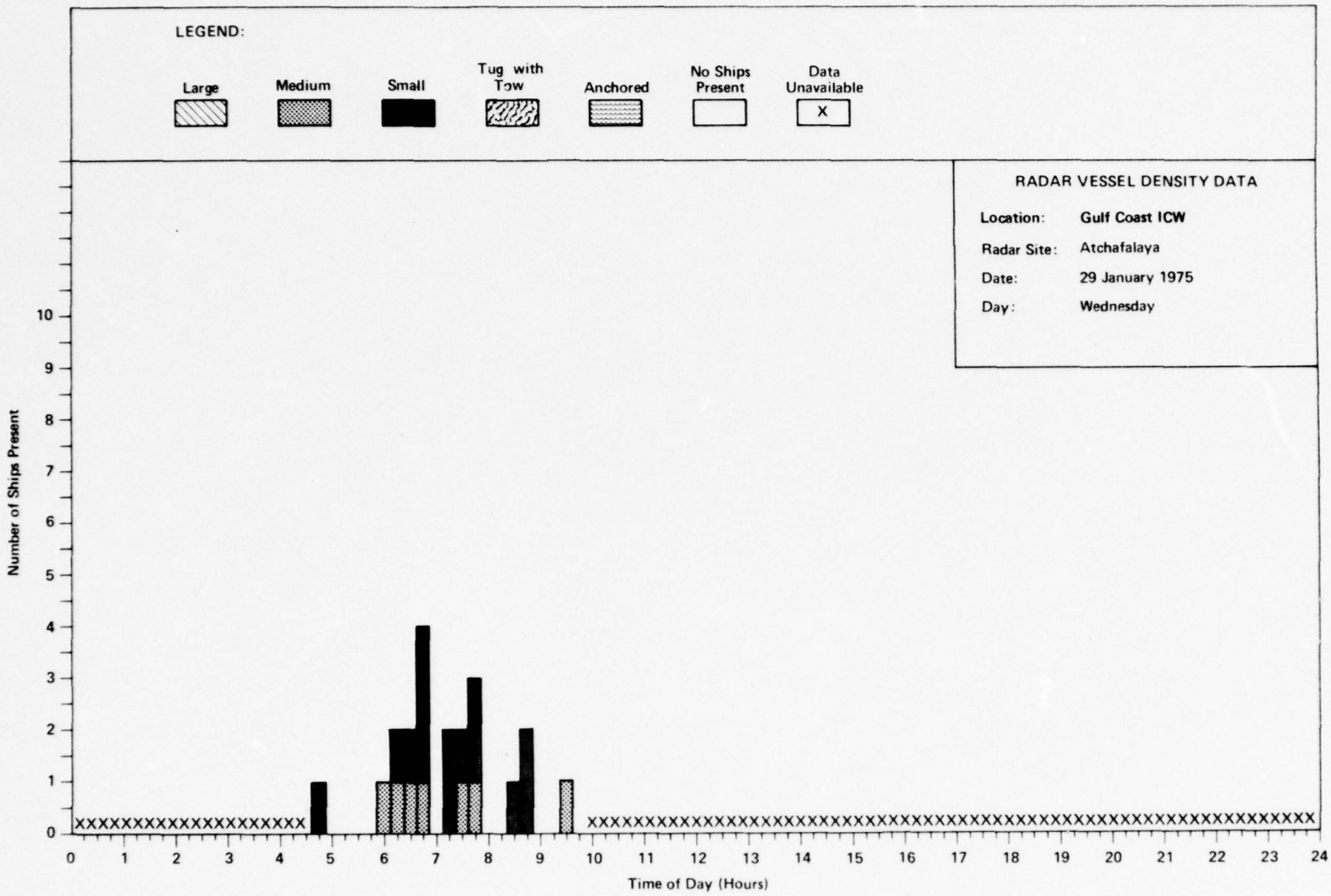

COMMUNICATIONS MESSAGE ACTIVITY
Channel 13
Location: Gulf Coast ICW
Van Site: Houma
Date: 21 January 1975
Day: Tuesday
Number of Messages
Time of Day (Hours)
X = No Messages
106
93

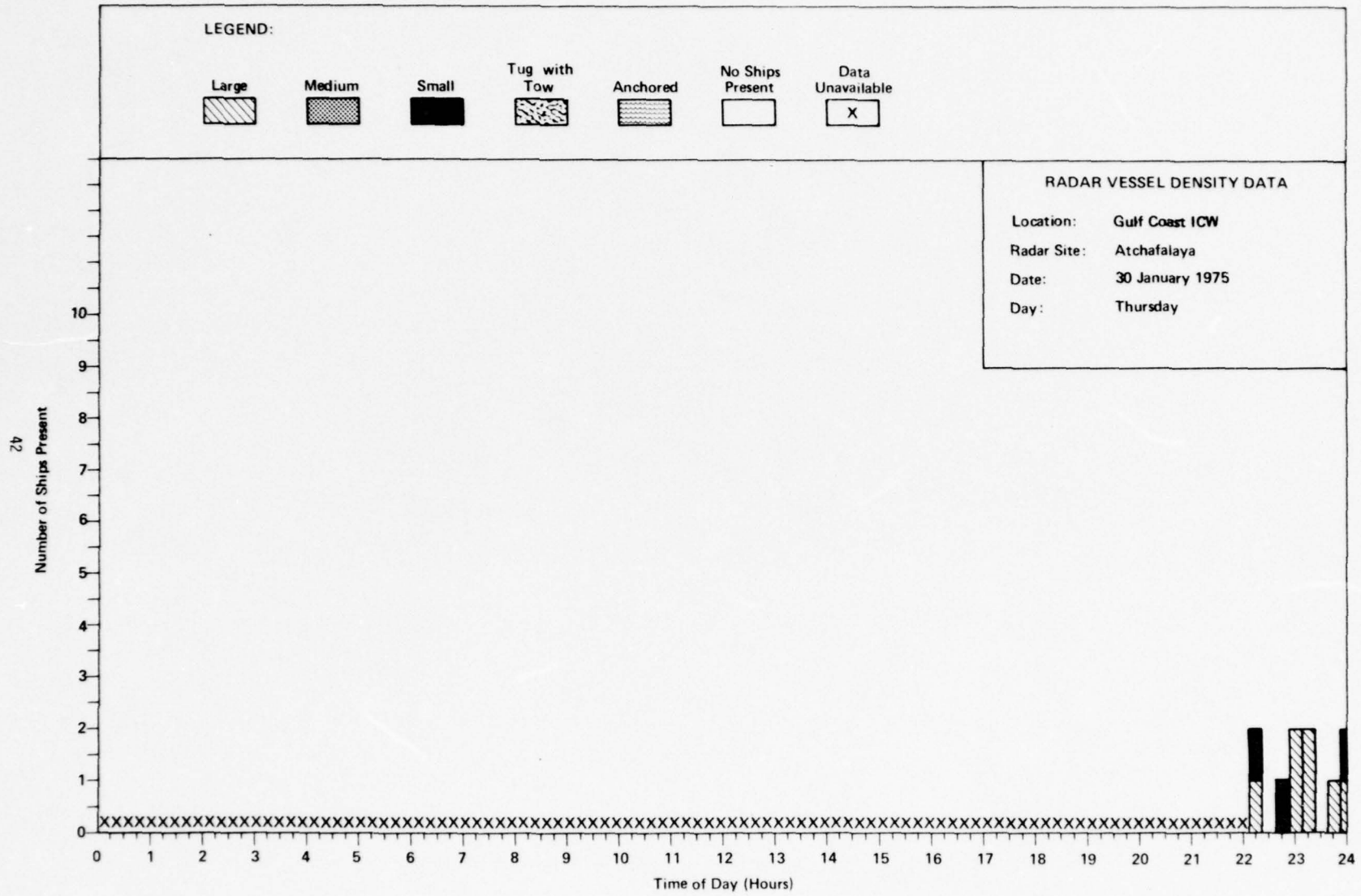

COMMUNICATIONS CHANNEL UTILIZATION
Channel 13
Location: Gulf Coast ICW
Van Site: Houma
Date: 21 January 1975
Day: Tuesday
Utilization (Percent)
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Time of Day (Hours)
0 = Zero Percent

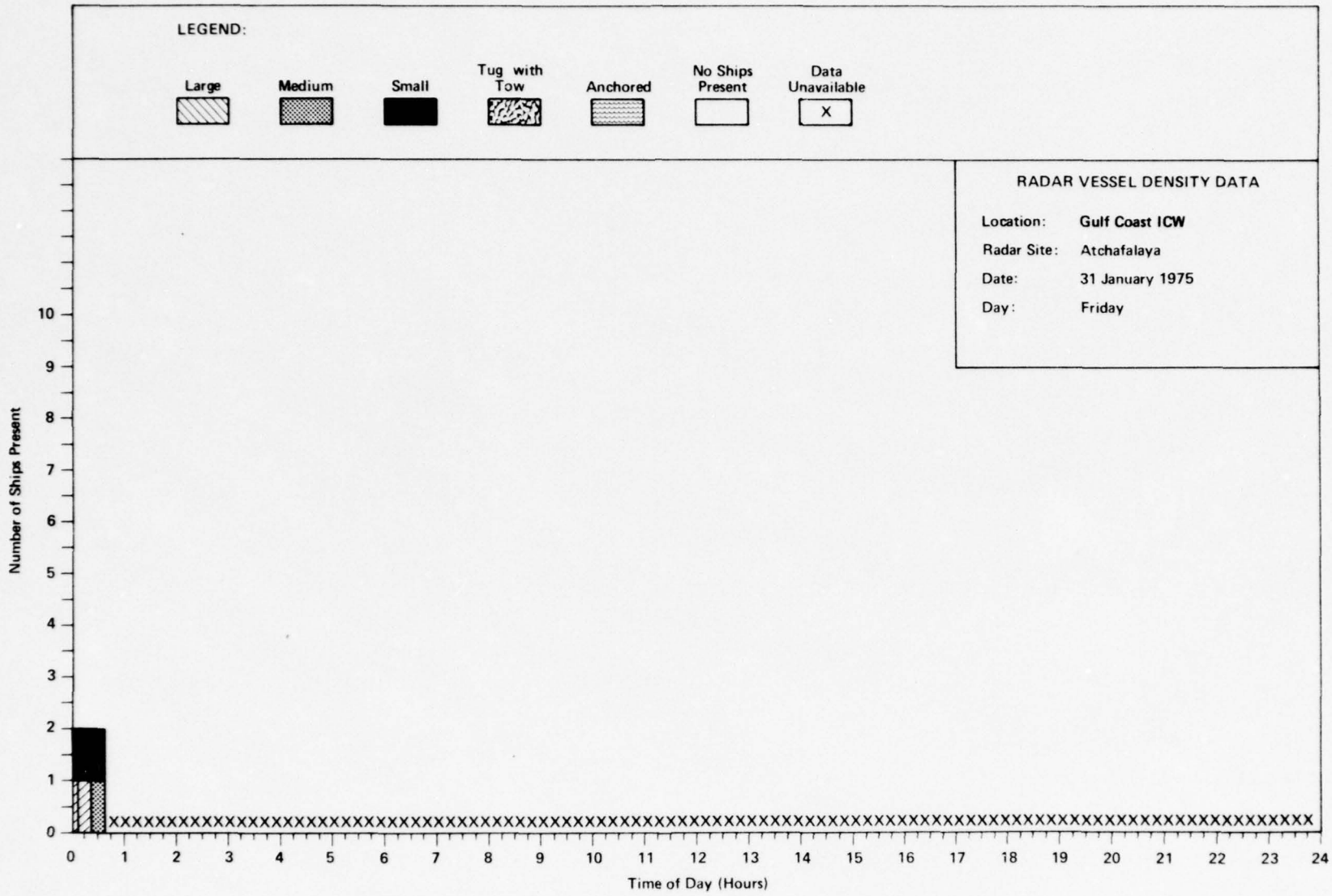

COMMUNICATIONS CHANNEL EFFICIENCY
Channel 13
Location: Gulf Coast ICW
Van Site: Houma
Date: 21 January 1975
Day: Tuesday
Percentage of Valid Messages to Total Transmissions
Time of Day (Hours)
0 = Zero Percent
X = No Messages

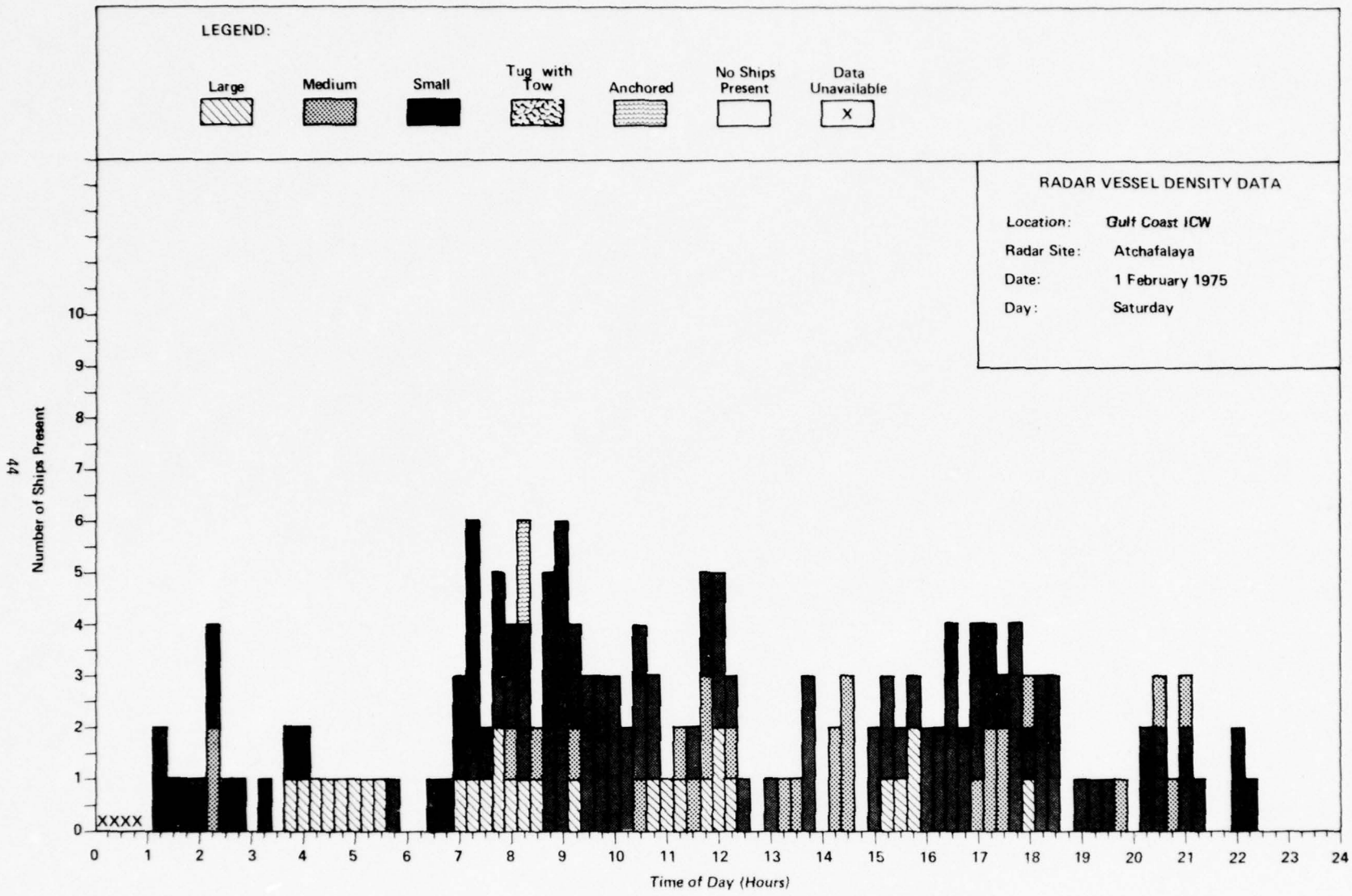
2.2 DATA FROM ATCHAFALAYA

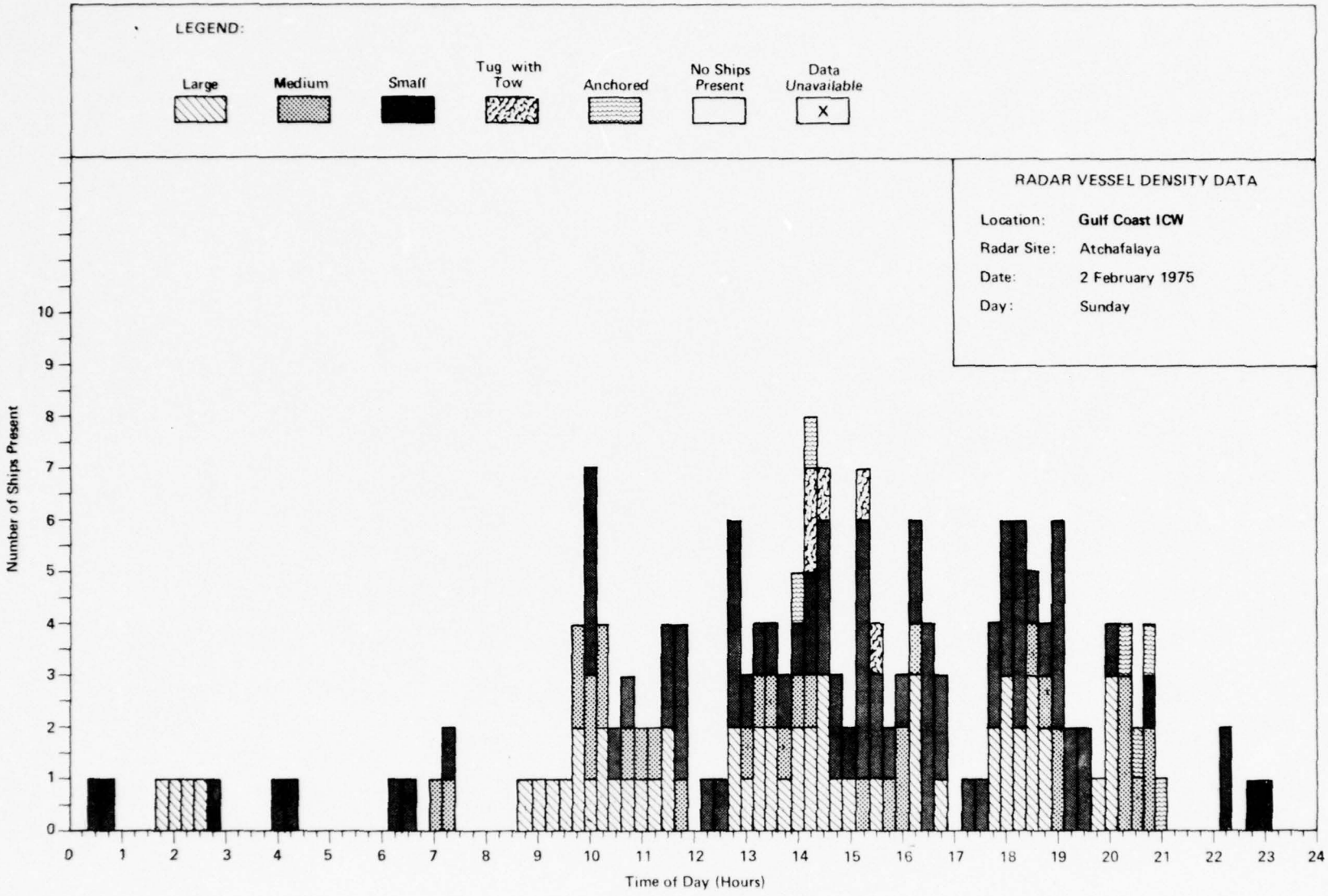

LEGEND:
Large
Medium
Small
Tug with Tow
Anchored
No Ships Present
Data Unavailable
X
RADAR VESSEL DENSITY DATA
Location: Gulf Coast ICW
Radar Site: Atchafalaya
Date: 28 January 1975
Day: Tuesday
Number of Ships Present
40
0
1
2
3
4
5
6
7
8
9
10
Time of Day (Hours)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24

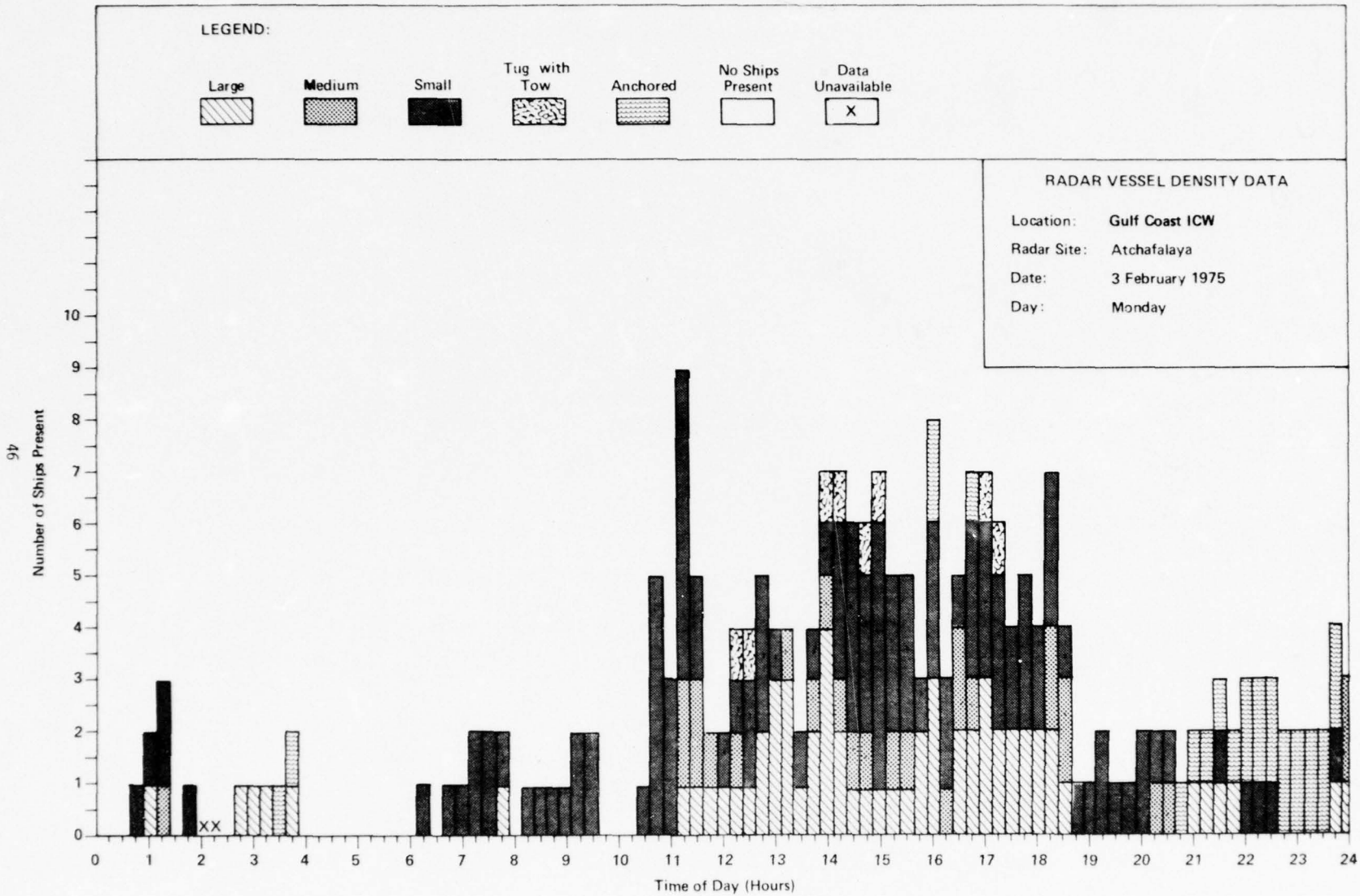

LEGEND:
Large
Medium
Small
Tug with Tow
Anchored
No Ships Present
Data Unavailable
X
RADAR VESSEL DENSITY DATA
Location: Gulf Coast ICW
Radar Site: Atchafalaya
Date: 29 January 1975
Day: Wednesday
Number of Ships Present
0
1
2
3
4
5
6
7
8
9
10
Time of Day (Hours)
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

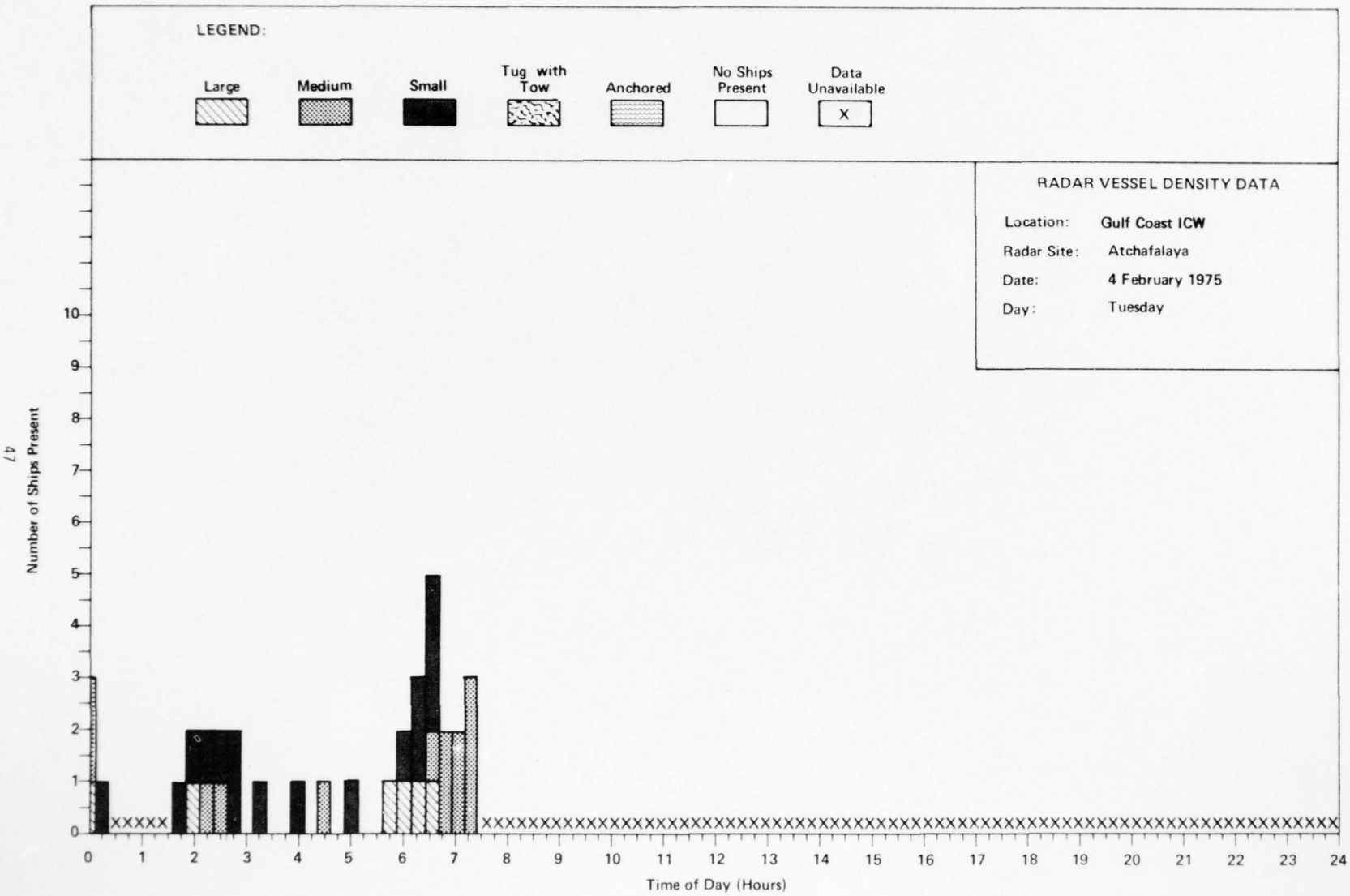

LEGEND:
Large
Medium
Small
Tug with Tow
Anchored
No Ships Present
Data Unavailable
X
RADAR VESSEL DENSITY DATA
Location: Gulf Coast ICW
Radar Site: Atchafalaya
Date: 30 January 1975
Day: Thursday
Number of Ships Present
0
1
2
3
4
5
6
7
8
9
10
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Time of Day (Hours)

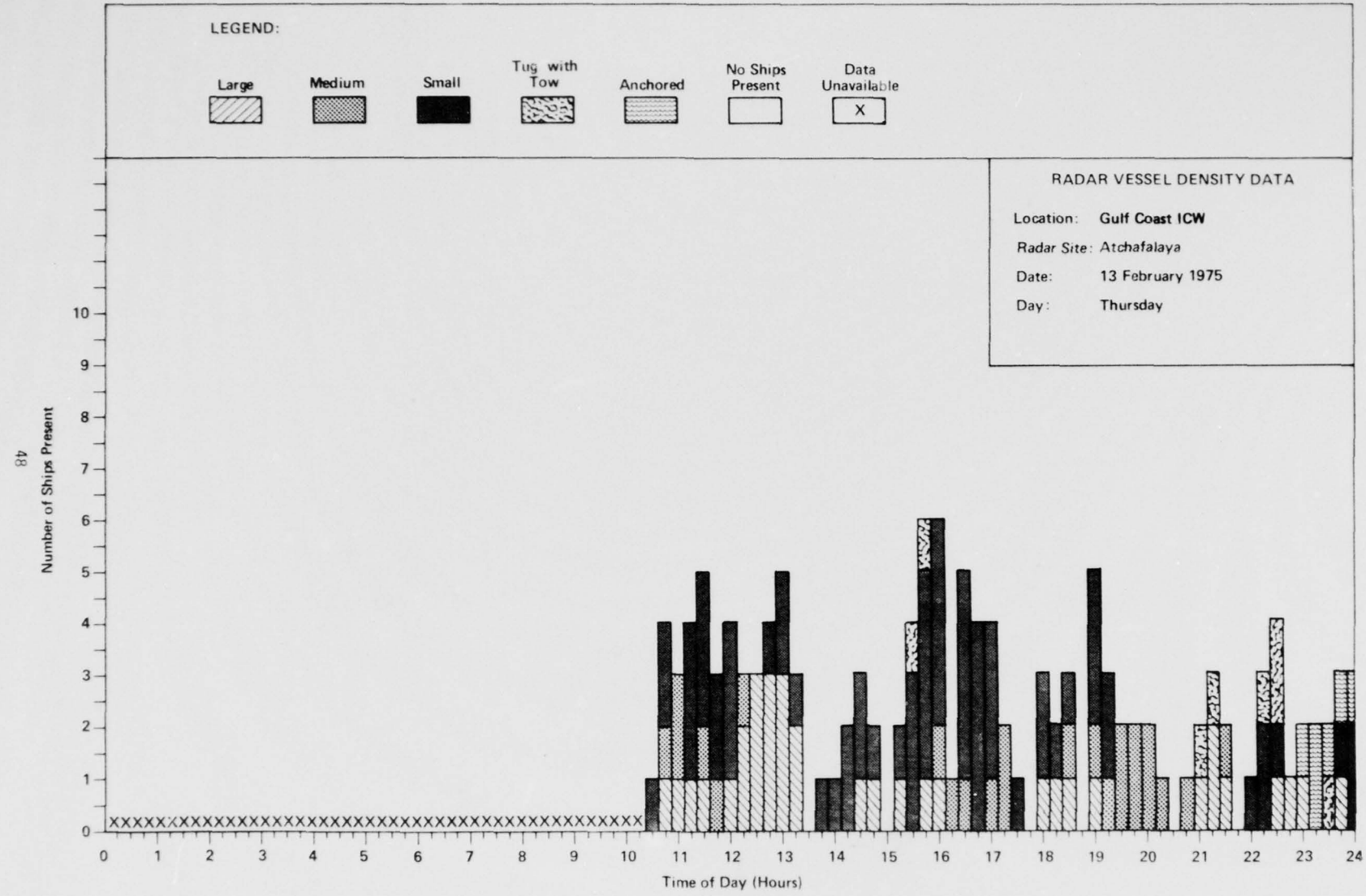

LEGEND:
Large
Medium
Small
Tug with Tow
Anchored
No Ships Present
Data Unavailable
X
RADAR VESSEL DENSITY DATA
Location: Gulf Coast ICW
Radar Site: Atchafalaya
Date: 31 January 1975
Day: Friday
Number of Ships Present
0
1
2
3
4
5
6
7
8
9
10
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Time of Day (Hours)

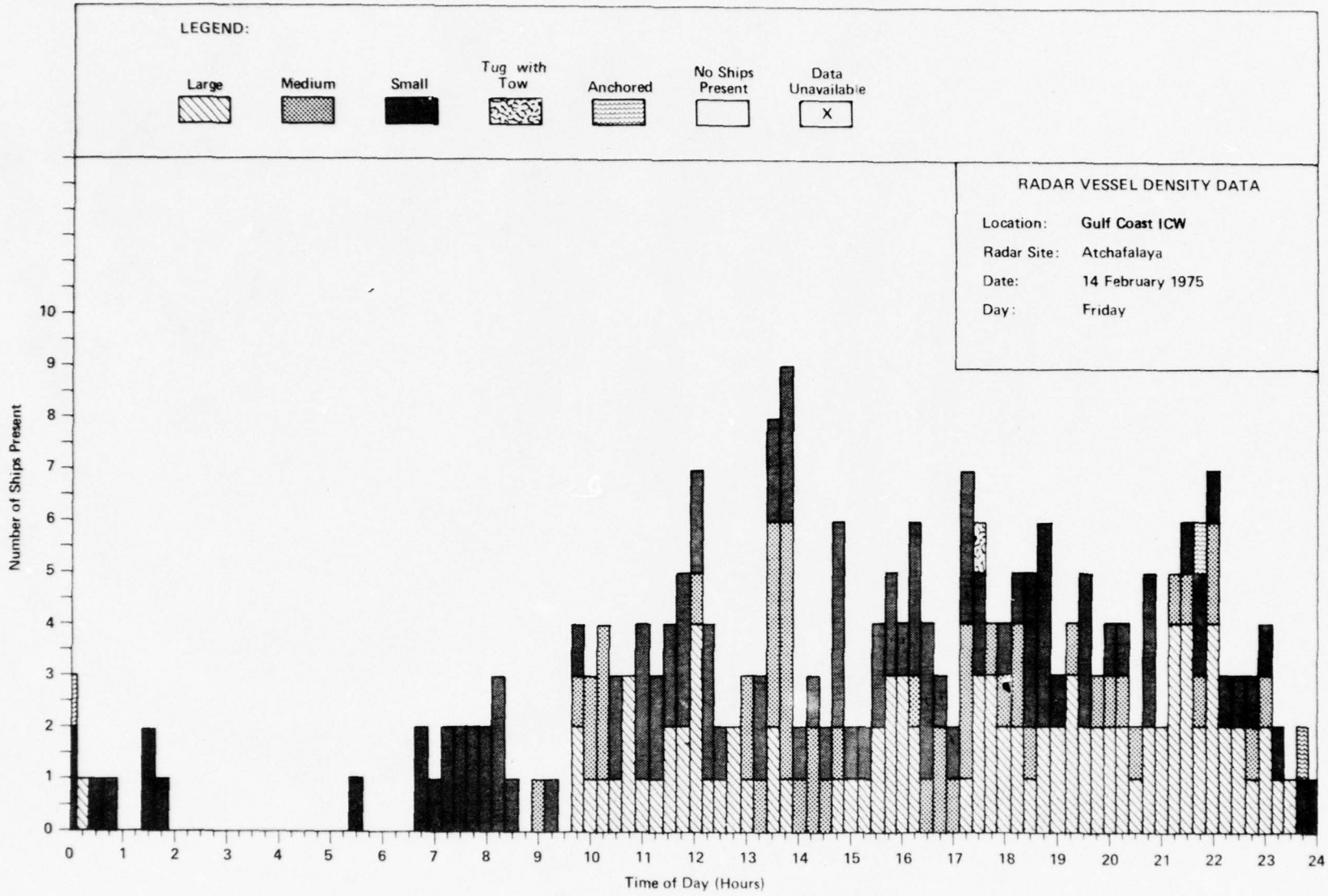

LEGEND:
Large
Medium
Small
Tug with Tow
Anchored
No Ships Present
Data Unavailable
X
RADAR VESSEL DENSITY DATA
Location: Gulf Coast ICW
Radar Site: Atchafalaya
Date: 1 February 1975
Day: Saturday
Number of Ships Present
Time of Day (Hours)
XXXX

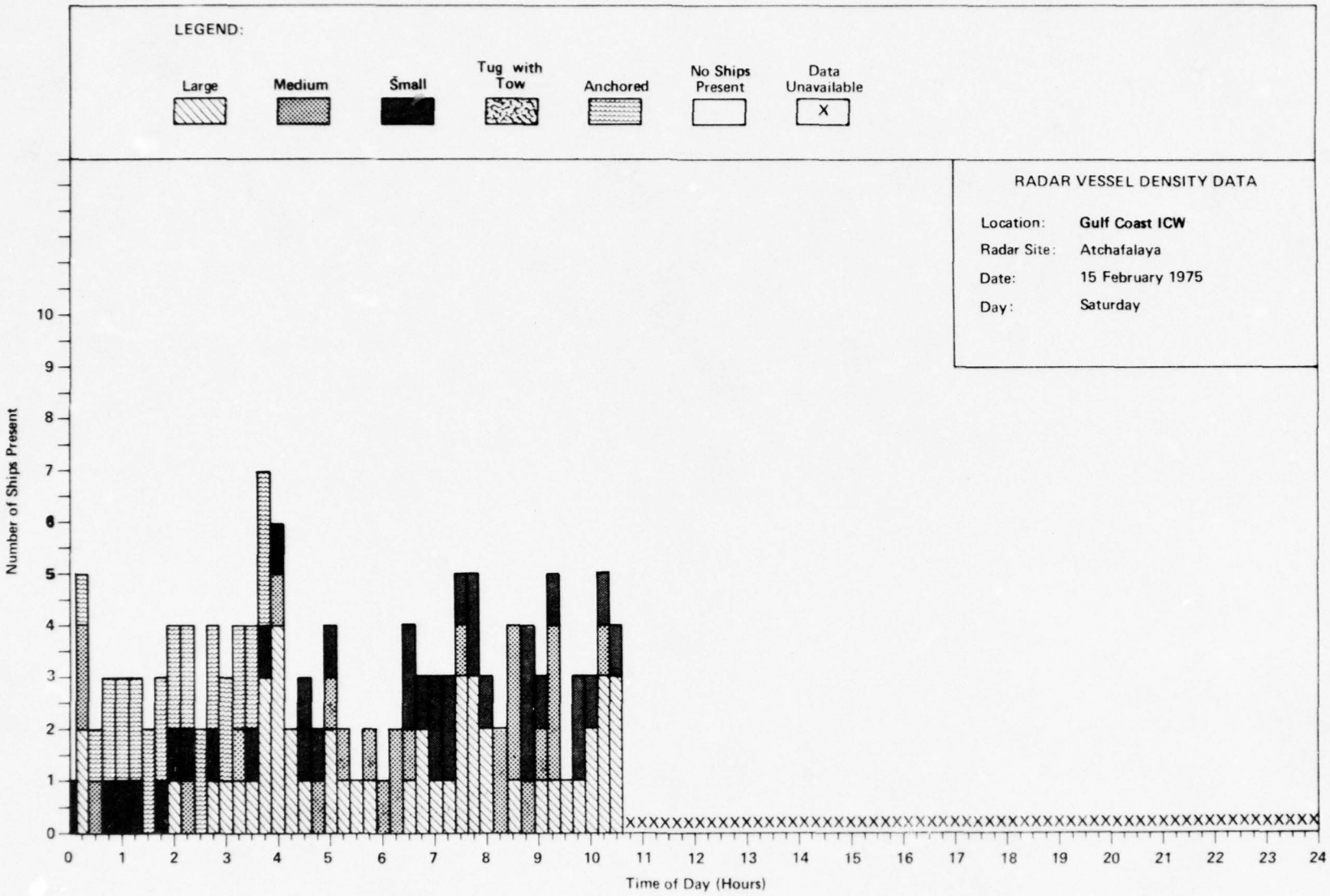

LEGEND:
Large
Medium
Small
Tug with Tow
Anchored
No Ships Present
Data Unavailable
X
RADAR VESSEL DENSITY DATA
Location: Gulf Coast ICW
Radar Site: Atchafalaya
Date: 2 February 1975
Day: Sunday
Number of Ships Present
0 1 2 3 4 5 6 7 8 9 10
Time of Day (Hours)
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

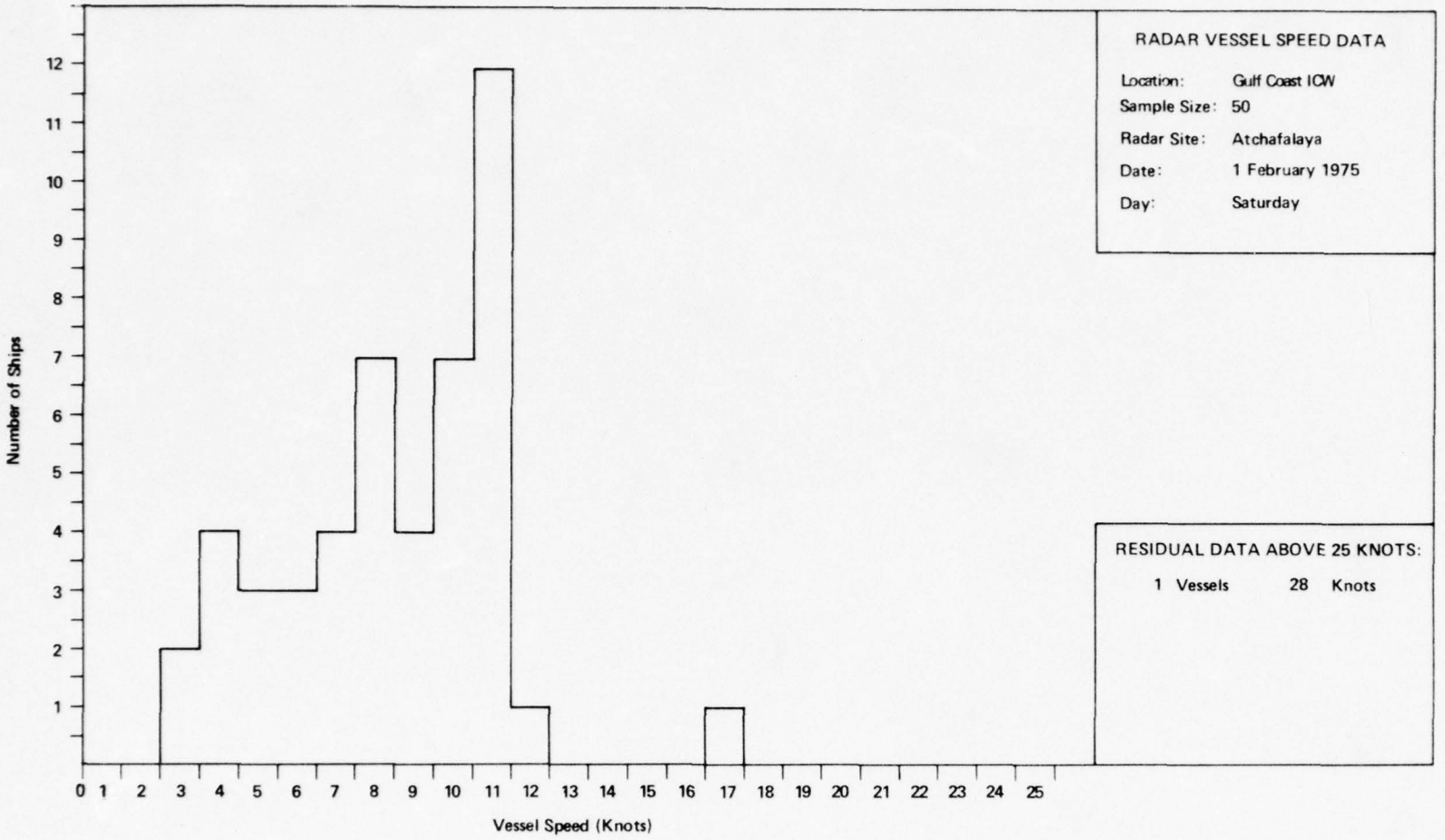

LEGEND:
Large
Medium
Small
Tug with Tow
Anchored
No Ships Present
Data Unavailable
X
RADAR VESSEL DENSITY DATA
Location: Gulf Coast ICW
Radar Site: Atchafalaya
Date: 3 February 1975
Day: Monday
Number of Ships Present
Time of Day (Hours)
XX

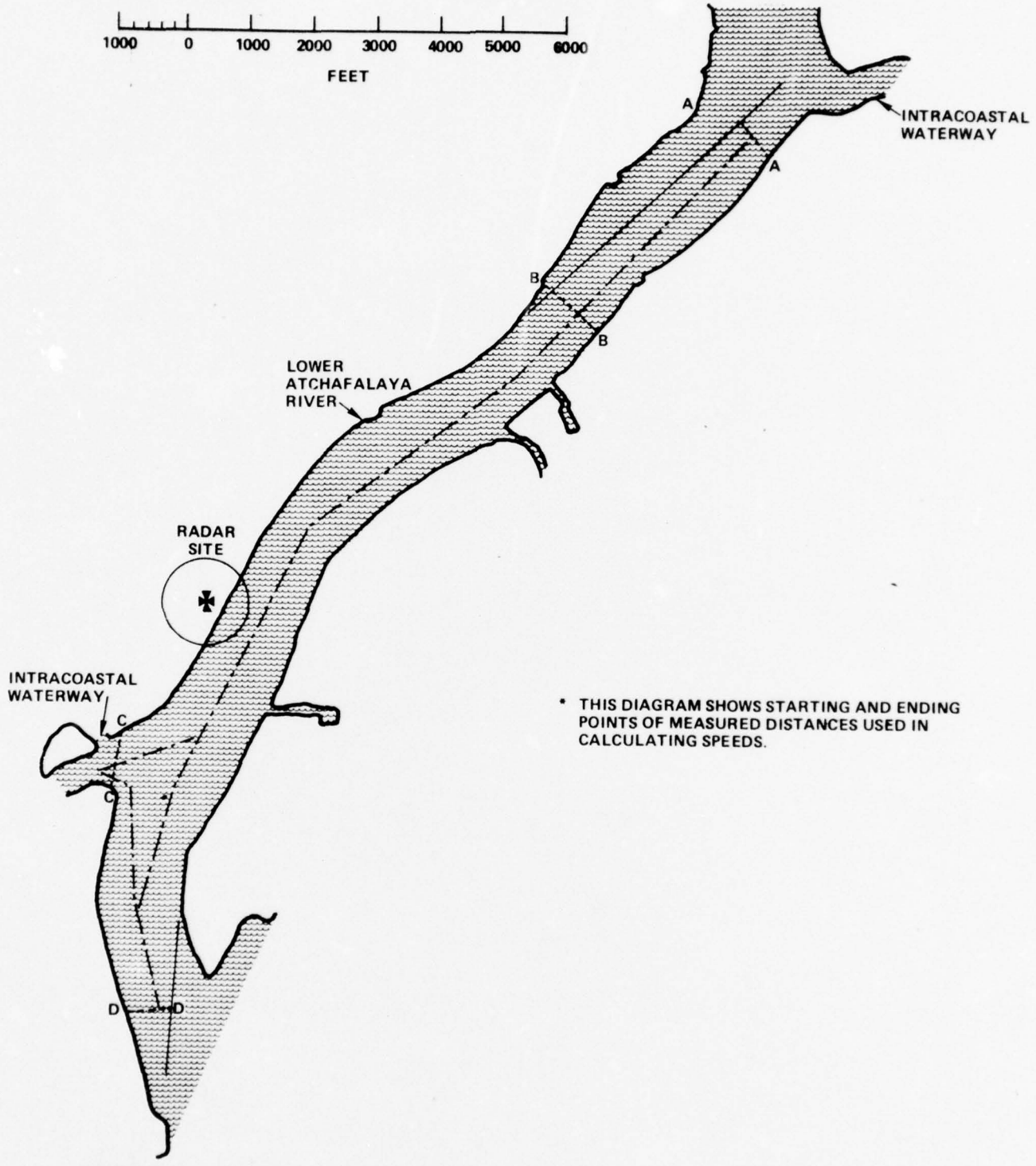

LEGEND:
Large
Medium
Small
Tug with Tow
Anchored
No Ships Present
Data Unavailable
X
RADAR VESSEL DENSITY DATA
Location: Gulf Coast ICW
Radar Site: Atchafalaya
Date: 4 February 1975
Day: Tuesday
Number of Ships Present
Time of Day (Hours)
0 1 2 3 4 5 6 7 8 9 10
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24


LEGEND:
Large
Medium
Small
Tug with Tow
Anchored
No Ships Present
Data Unavailable
X
RADAR VESSEL DENSITY DATA
Location: Gulf Coast ICW
Radar Site: Atchafalaya
Date: 13 February 1975
Day: Thursday
Number of Ships Present
Time of Day (Hours)
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24


LEGEND:
Large
Medium
Small
Tug with Tow
Anchored
No Ships Present
Data Unavailable
X
RADAR VESSEL DENSITY DATA
Location: Gulf Coast ICW
Radar Site: Atchafalaya
Date: 14 February 1975
Day: Friday
Number of Ships Present
0
1
2
3
4
5
6
7
8
9
10
Time of Day (Hours)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24


LEGEND:
Large
Medium
Small
Tug with Tow
Anchored
No Ships Present
Data Unavailable
X
RADAR VESSEL DENSITY DATA
Location: Gulf Coast ICW
Radar Site: Atchafalaya
Date: 15 February 1975
Day: Saturday
Number of Ships Present
Time of Day (Hours)
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24


RADAR VESSEL SPEED DATA
Location: Gulf Coast ICW
Sample Size: 50
Radar Site: Atchafalaya
Date: 1 February 1975
Day: Saturday
RESIDUAL DATA ABOVE 25 KNOTS:
1 Vessels 28 Knots
Number of Ships
Vessel Speed (Knots)
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
1 2 3 4 5 6 7 8 9 10 11 12



SPEED CALCULATION TIMING POINTS FOR ATCHAFALAYA*

SPEED DATA
FOR
ATCHAFALAYA

Vessel No.	Vessel Size	Average Speed in Knots	Direction *	Day	Time Hour/Minute	
1	medium	11	A-C	1 February 1975 Saturday	01	45
2	medium	7	C-B		01	57
3	small	8	D-A		02	02
4	small	11	A-D		02	08
5	small	9	B-D		02	31
6	large	6	A-C		03	39
7	small	10	B-A		03	41
8	medium	7	C-B		03	47
9	large	4	C-A		04	50
10	medium	11	B-C		07	05
11	small	8	A-D		07	05
12	medium	4	B-A		07	15
13	large	5	C-B		07	35
14	small	11	A-B		07	39
15	small	11	A-B		07	40
16	small	11	A-B		07	41
17	small	10	A-C		07	48
18	small	12	A-D		07	52
19	large	9	A-C		08	12
20	small	28	B-A		08	59
21	medium	11	A-C		09	03
22	large	11	A-C		09	09
23	small	8	A-B		09	18
24	small	8	B-A		10	05
25	small	8	A-C		10	16
26	medium	7	A-C		10	21
27	large	3	C-A		10	31

* See Figure "Speed Calculation Timing Points for Atchafalaya"

SPEED DATA
FOR
ATCHAFALAYA (Cont'd)

Vessel No.	Vessel Size	Average Speed in Knots	Location*	Direction*	Day	Time Hour/Minute	
28	tug with tow	4		D-A	1 February 1975 Saturday	11	39
29	large	9		A-C		11	52
30	medium	10		A-B		12	02
31	medium	4		C-D		12	06
32	small	7		D-A		13	09
33	small	11		A-D		13	31
34	small	11		B-C		13	42
35	small	11		B-D		13	43
36	medium	10		A-C		14	16
37	small	11		A-D		15	04
38	large	3		C-A		15	08
39	large	8		A-C		15	32
40	small	5		C-B		15	57
41	small	8		A-C		16	03
42	small	6		C-A		16	46
43	small	6		B-A		16	57
44	small	9		A-B		17	18
45	large	10		B-C		17	51
46	large	10		B-C		17	56
47	small	17		C-B		18	10
48	small	5		C-A		18	10
49	medium	10		B-C		18	33

* See Figure "Speed Calculation Timing Points for Atchafalaya"

CLOSE ENCOUNTER
FOR
ATCHAFALAYA

No.	Day	Time Hour	Time Minute	Distance Yards	Size	Manner of Approach*
1	Monday	14	30	150	2 small	P
2	3 February 1975	14	31	200	2 small	P
3	↓	14	41	150	1 medium, 1 small	P
4		14	46	<100	1 large, 1 small	P
5		14	48	<100	2 small	P
6		14	53	200	1 large, 1 small	P
7		14	54	200	1 medium, 1 small	P
8		15	10	<100	1 large, 1 small	P
9		15	12	200	2 small	P
10		15	15	<100	1 medium, 1 small	P
11		15	19	<100	1 large, 1 medium	P
12		15	22	<100	1 medium, 1 small	O
13		15	30	<100	1 large, 1 medium	P
14		15	39	<200	1 large, 1 small	P
15		15	41	100	1 large, 1 small	P
16		15	47	<100	1 large, 1 medium	P
17		15	48	<100	1 large, 1 small	P
18		15	50	200	1 medium, 1 small	P
19		15	58	200	2 small	P
20		15	59	<100	2 small	P
21		16	03	200	1 large, 1 small	P
22		16	14	<100	2 small	P
23		16	19	<100	2 small	P
24		16	21	175	1 medium, 1 small	P
25		16	23	<100	1 medium, 1 small	P
26		16	29	<100	2 large	P
27	↓	16	29	150	2 medium	P

*P = Passing
O = Overtaking
C = Crossing

< = less than

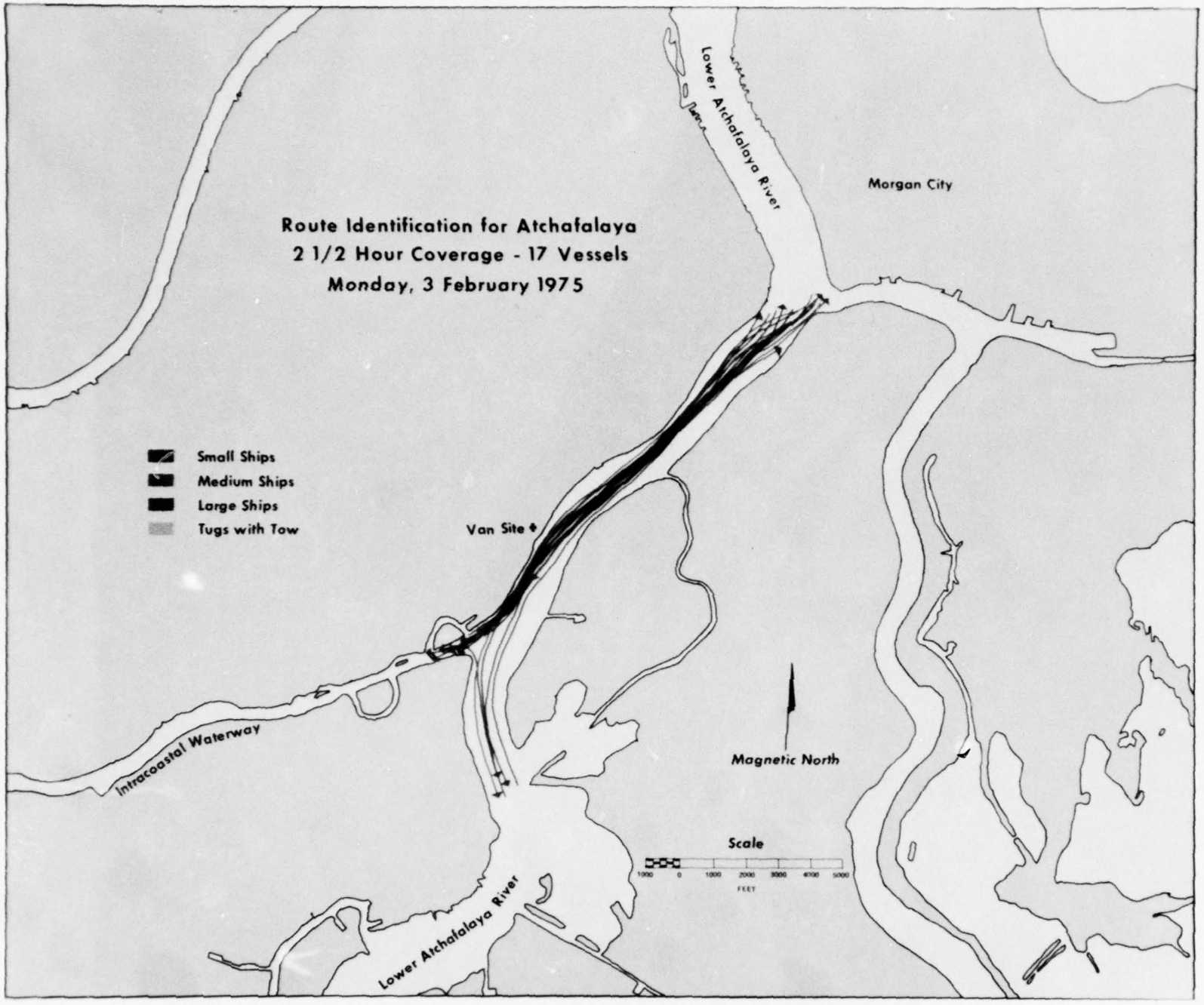
CLOSE ENCOUNTER
FOR
ATCHAFALAYA (Cont'd)

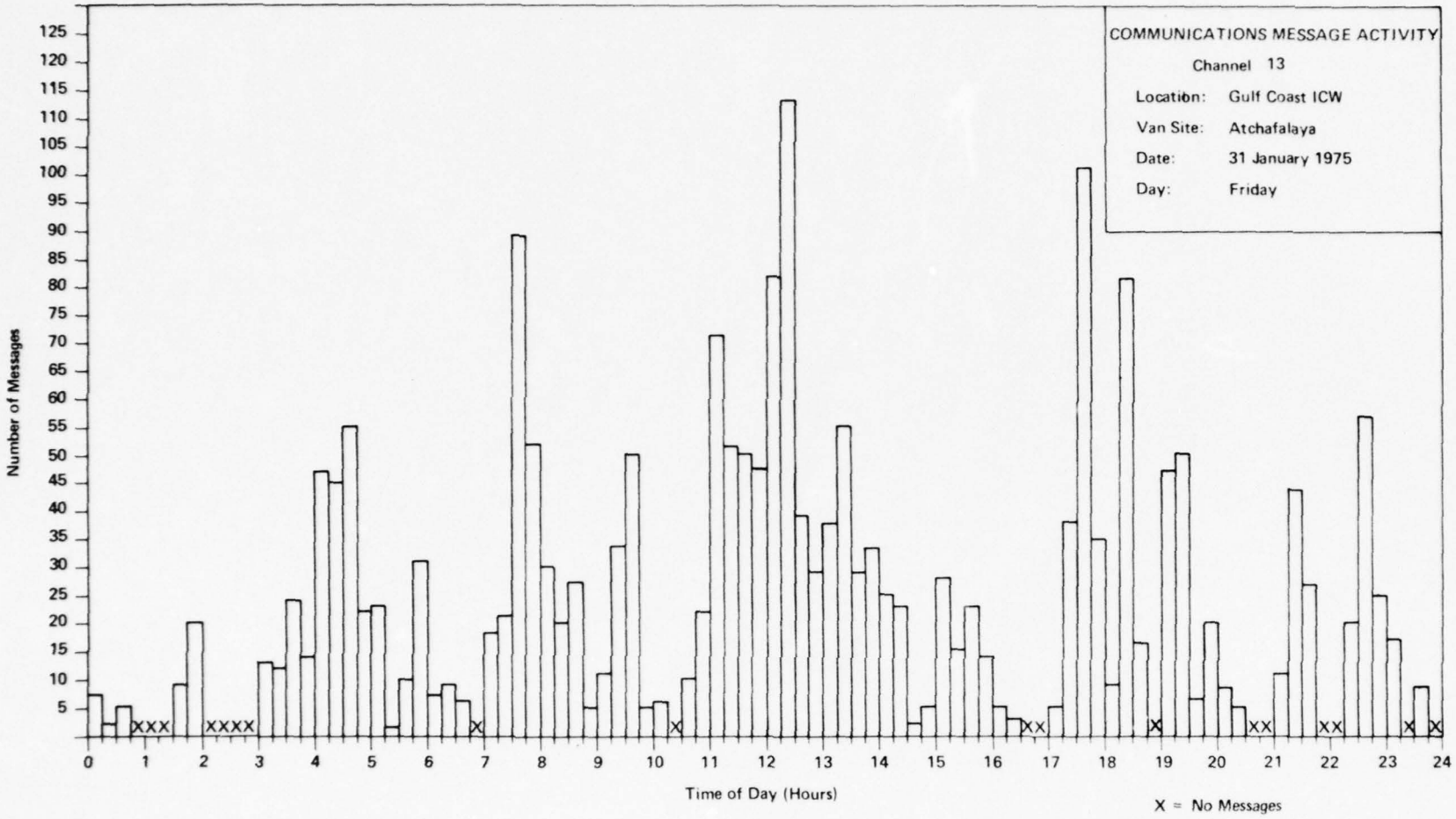
No.	Day	Time Hour	Time Minute	Distance Yards	Size	Manner of Approach*
28	Monday	16	32	<100	1 large, 1 medium	P
29	3 February 1975	16	34	<100	2 large	P
30		16	41	<100	1 large, 1 medium	P
31		16	42	<100	1 medium, 1 small	O
32		16	43	<100	2 small	O
33		16	50	150	1 large, 1 small	P
34		16	51	<100	1 medium, 1 small	P
35		16	55	<100	2 large	P
36		16	58	200	2 large	P
37		17	02	<100	2 large	P
38		17	04	<100	2 large	P
39		17	13	200	1 large, 1 small	P
40		17	15	<100	2 small	P
41		17	20	<100	2 small	P
42		17	23	<50	2 small	P
43		17	24	<100	1 medium, 1 small	P
44		17	25	<100	1 large, 1 small	P
45		17	25	<100	1 large, 1 medium	P
46		17	27	<100	1 large, 1 small	P
47		17	28	<100	1 medium, 1 small	P
48		17	34	200	2 small	O
49		17	34	175	1 medium, 1 small	P
50		17	42	<100	2 small	O

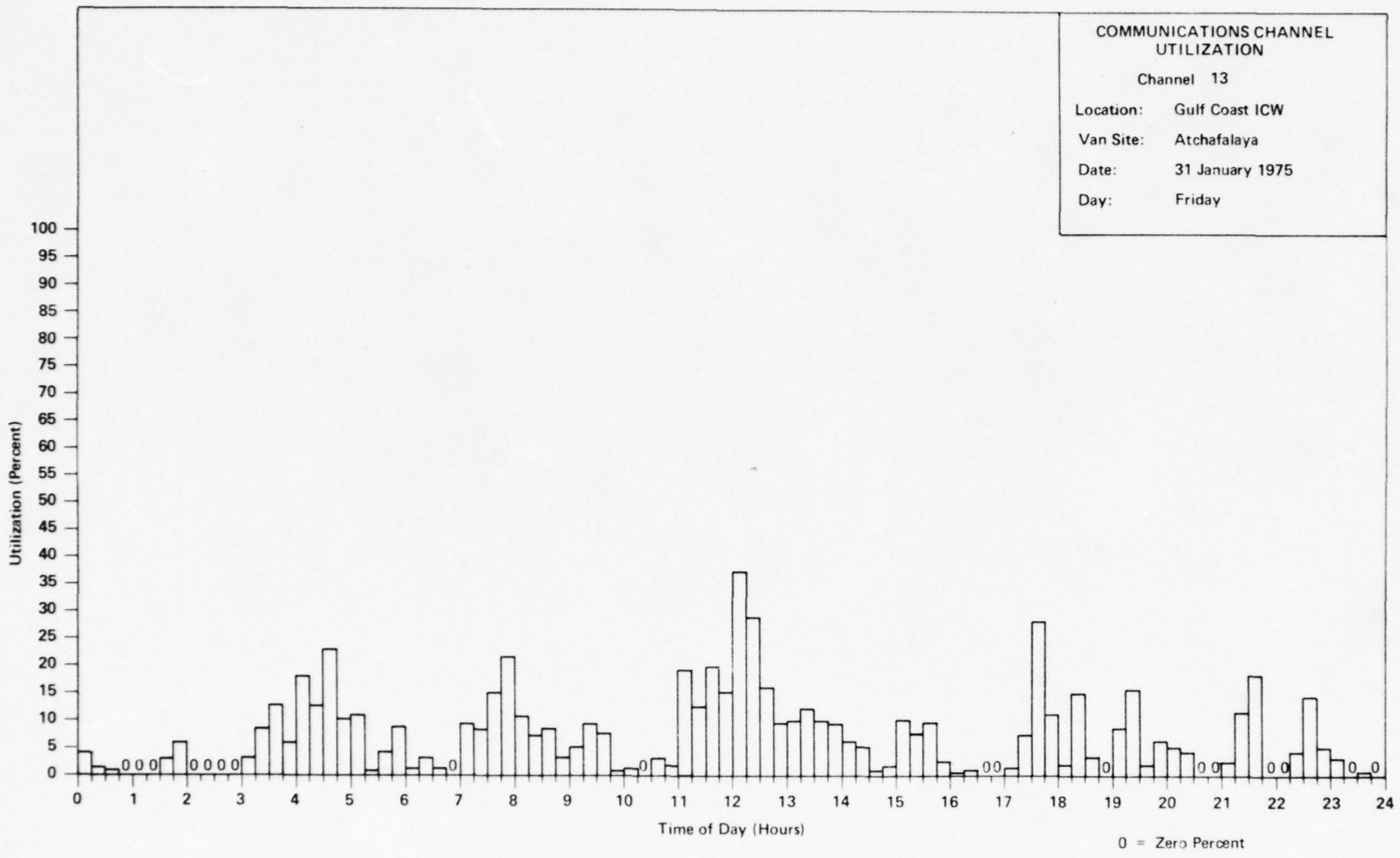
50 close encounters out of a total 67 encounters in 3 hours and 15 minutes coverage.

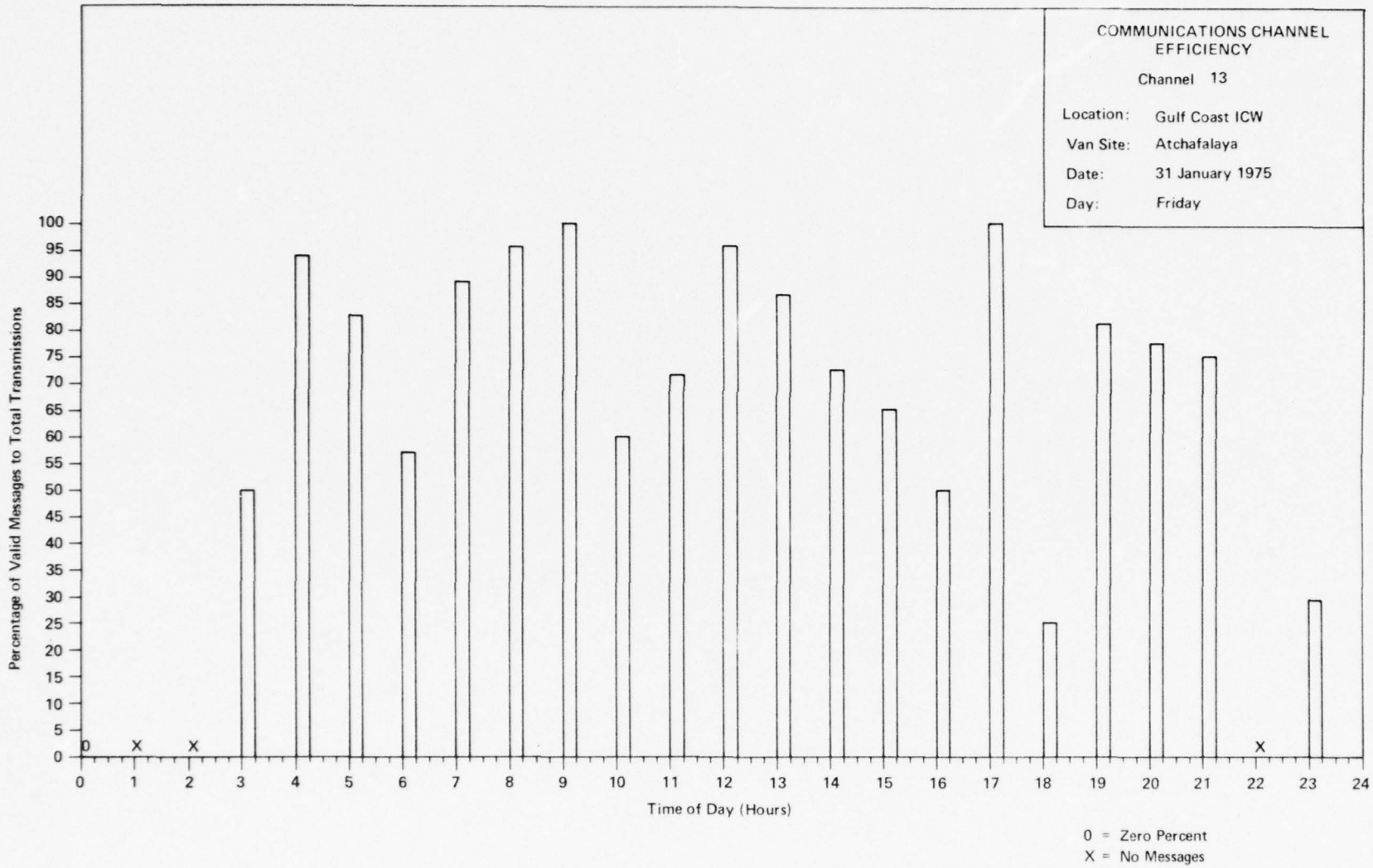
*P = Passing
O = Overtaking
C = Crossing

< = less than


Route Identification for Atchafalaya
2 1/2 Hour Coverage - 17 Vessels
Monday, 3 February 1975
Small Ships
Medium Ships
Large Ships
Tugs with Tow
Van Site
Lower Atchafalaya River
Morgan City
Intracoastal Waterway
Magnetic North
Scale
1000 0 1000 2000 3000 4000 5000
FEET
Lower Atchafalaya River

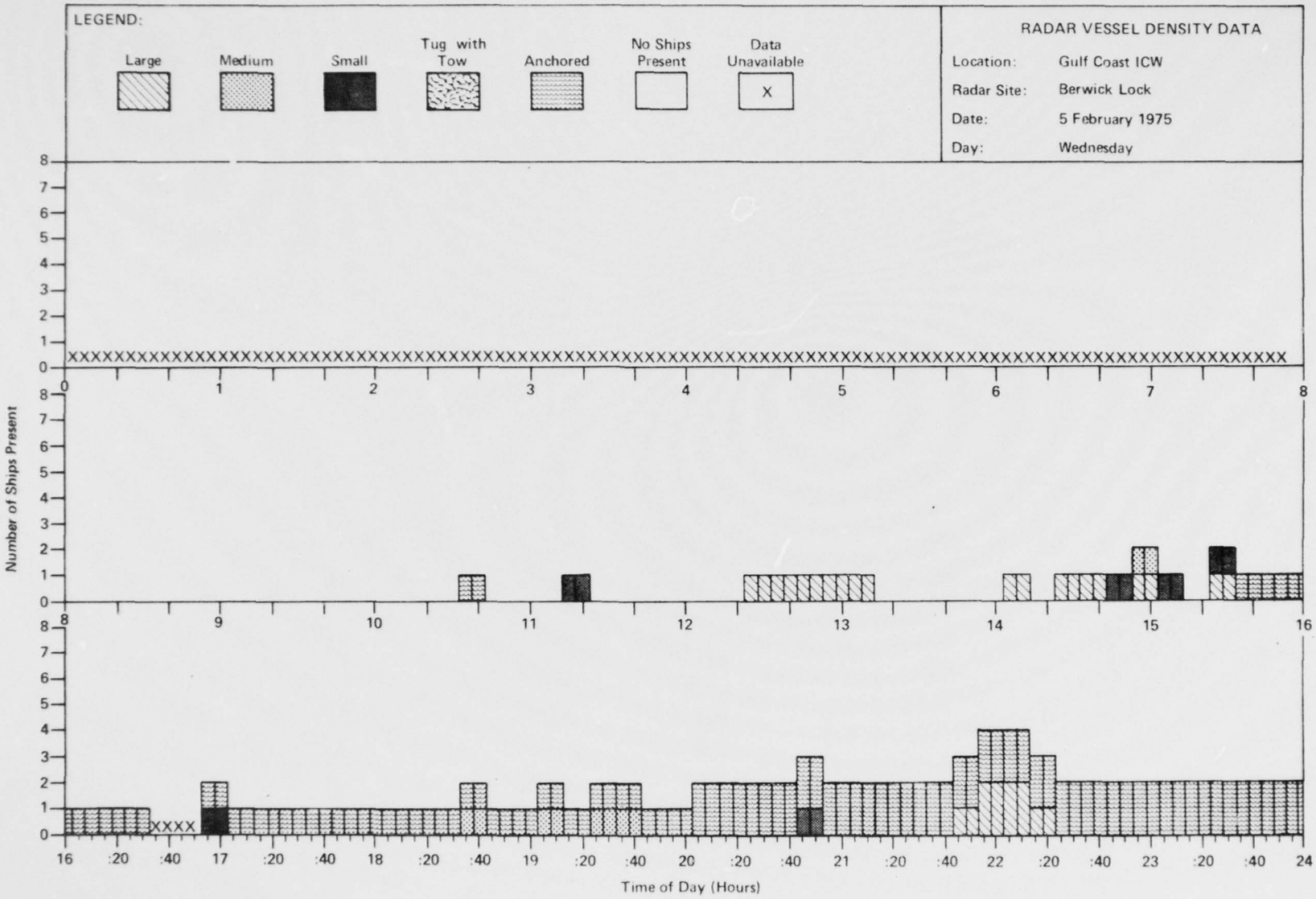

COMMUNICATIONS MESSAGE ACTIVITY
Channel 13
Location: Gulf Coast ICW
Van Site: Atchafalaya
Date: 31 January 1975
Day: Friday
Number of Messages
Time of Day (Hours)
X = No Messages

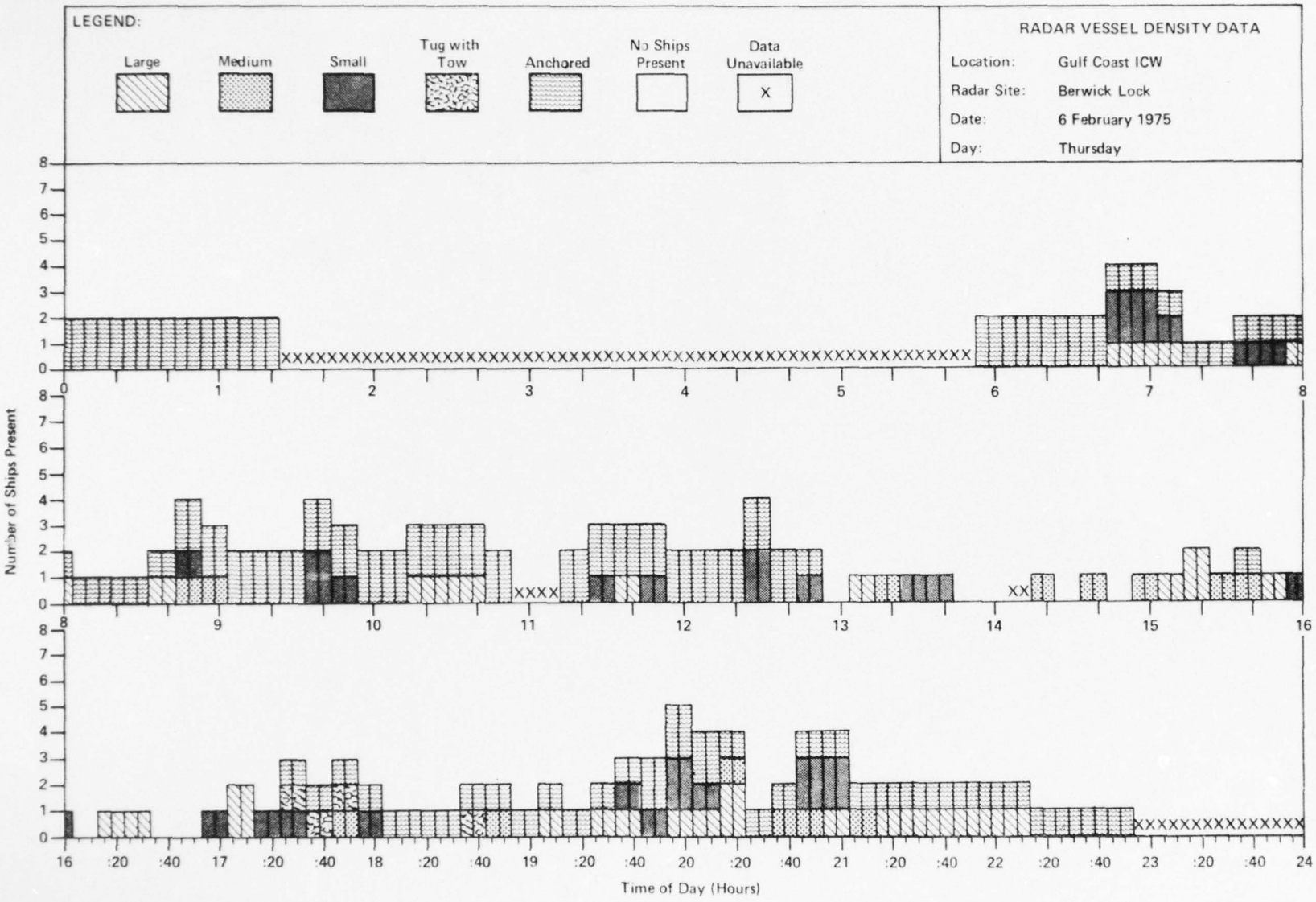

COMMUNICATIONS CHANNEL UTILIZATION
Channel 13
Location: Gulf Coast ICW
Van Site: Atchafalaya
Date: 31 January 1975
Day: Friday
Utilization (Percent)
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Time of Day (Hours)
0 = Zero Percent

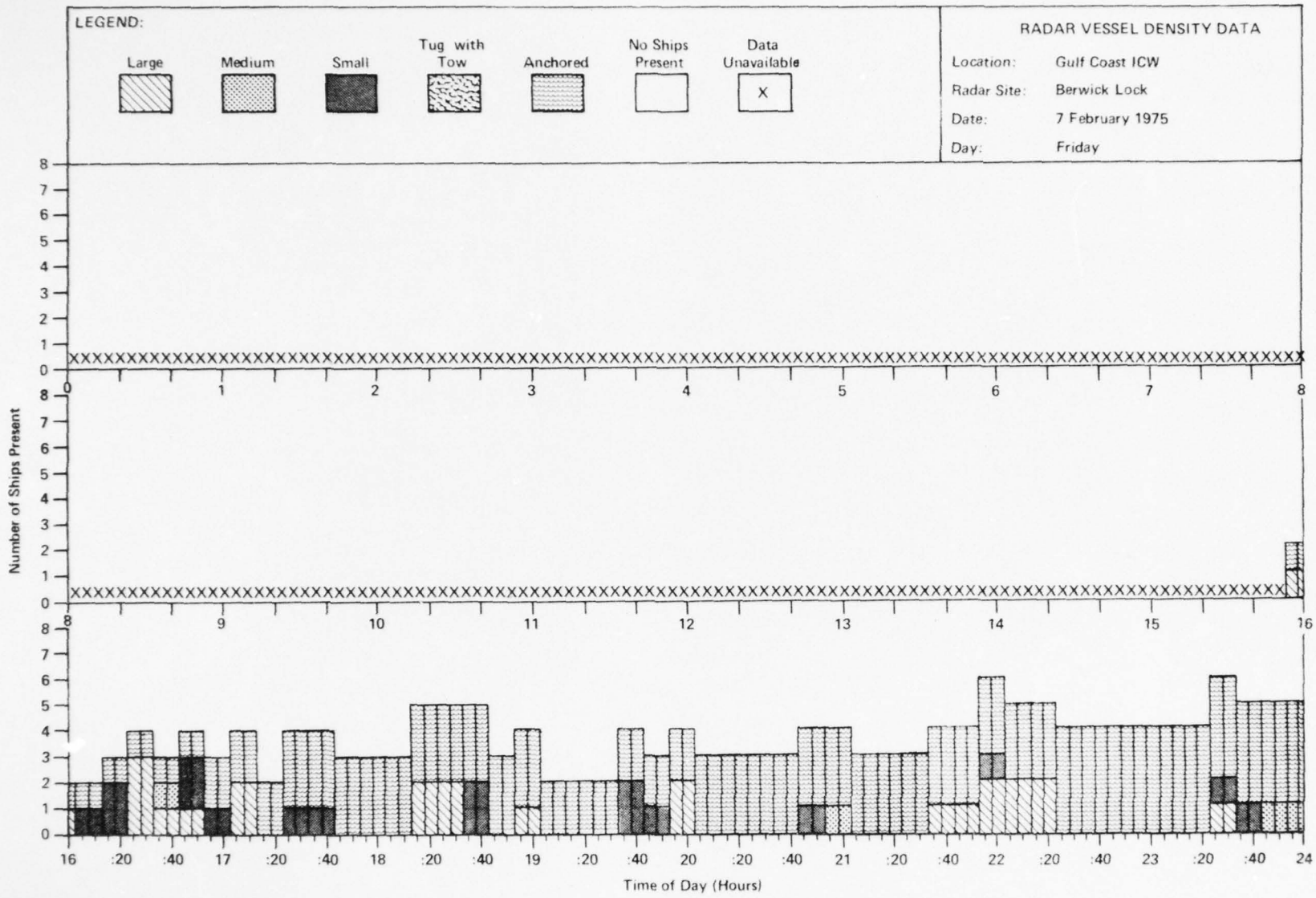

COMMUNICATIONS CHANNEL EFFICIENCY
Channel 13
Location: Gulf Coast ICW
Van Site: Atchafalaya
Date: 31 January 1975
Day: Friday
Percentage of Valid Messages to Total Transmissions
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
0 X X
X
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Time of Day (Hours)
0 = Zero Percent
X = No Messages

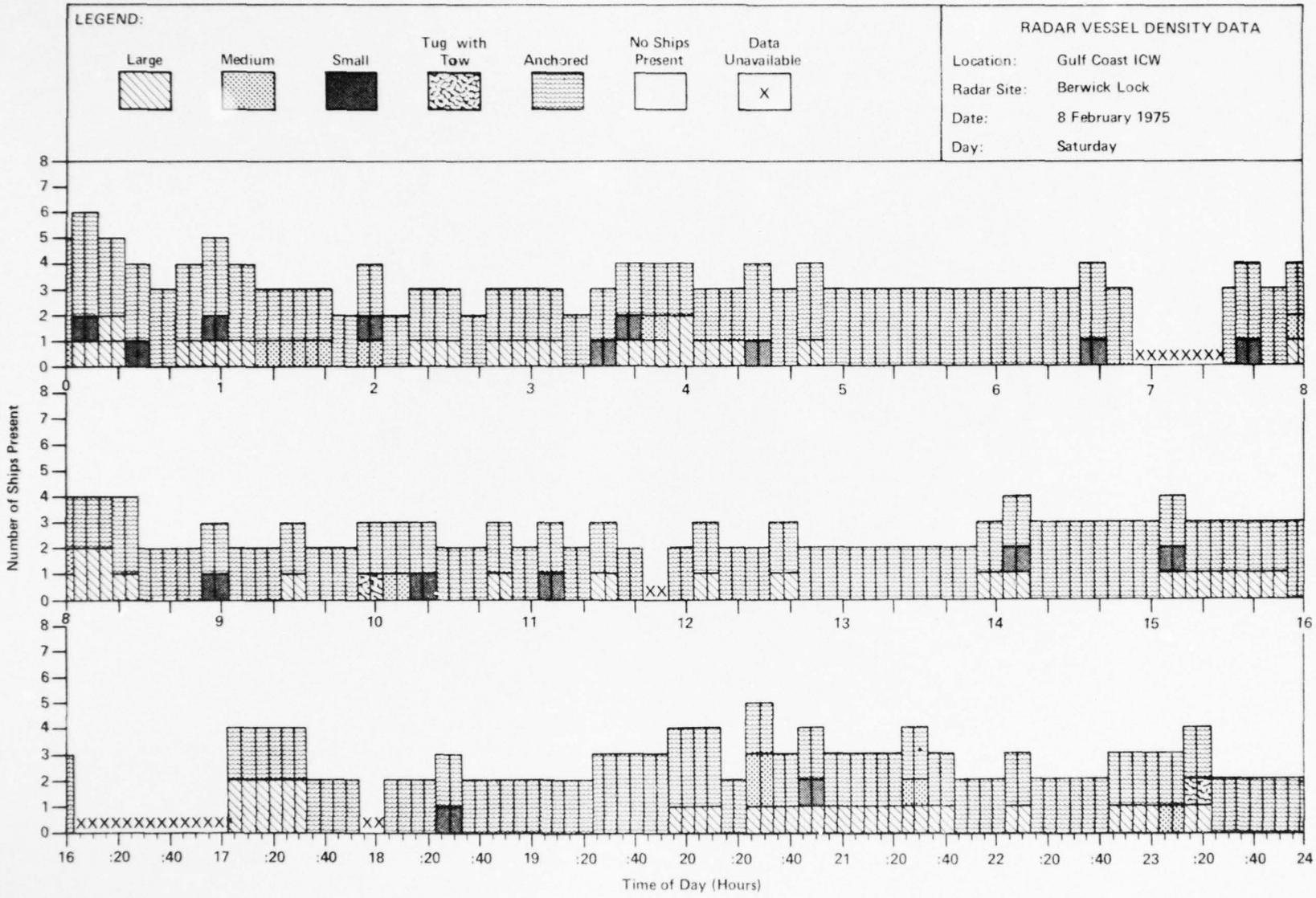
09

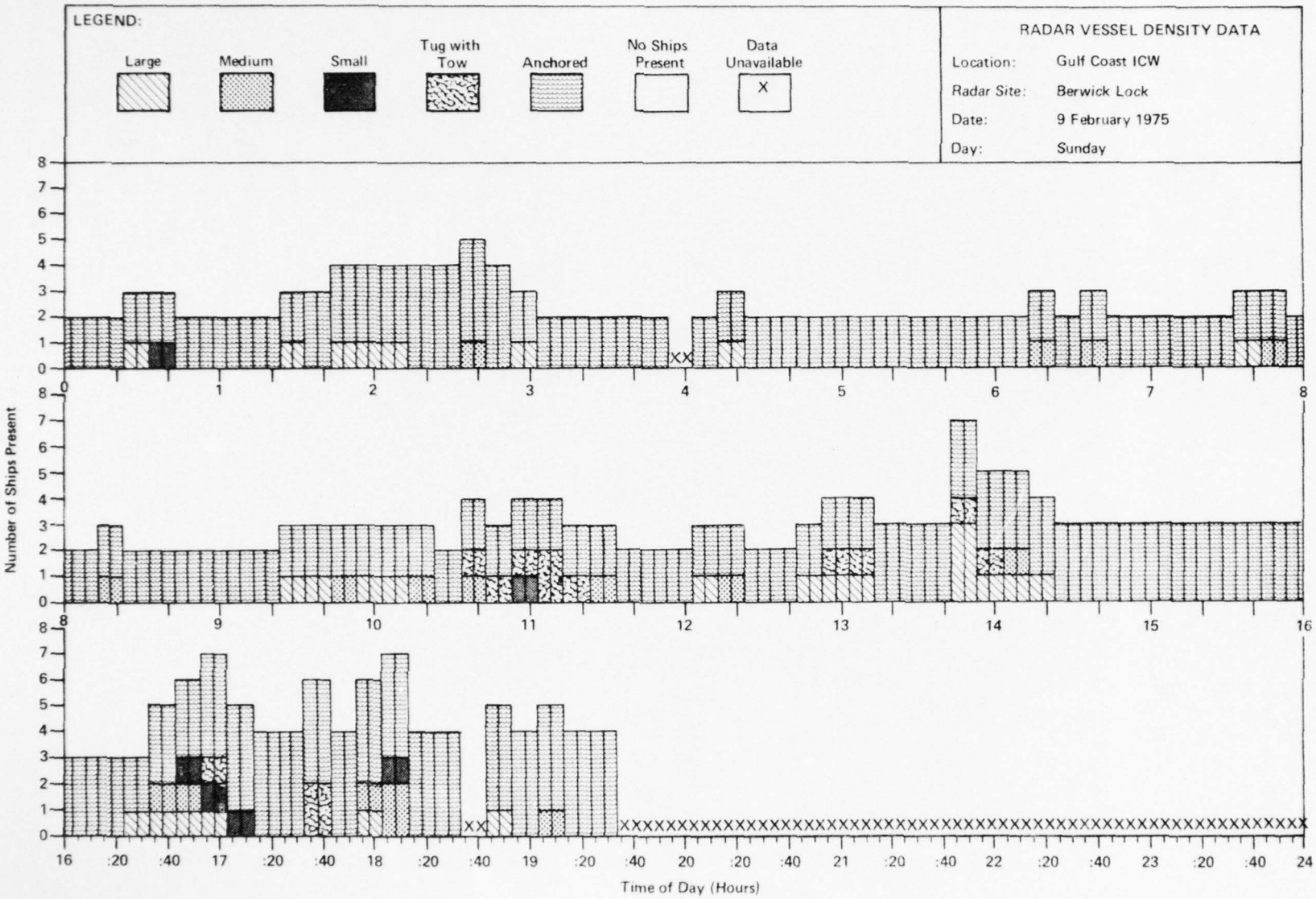
2.3 DATA FROM BERWICK LOCK

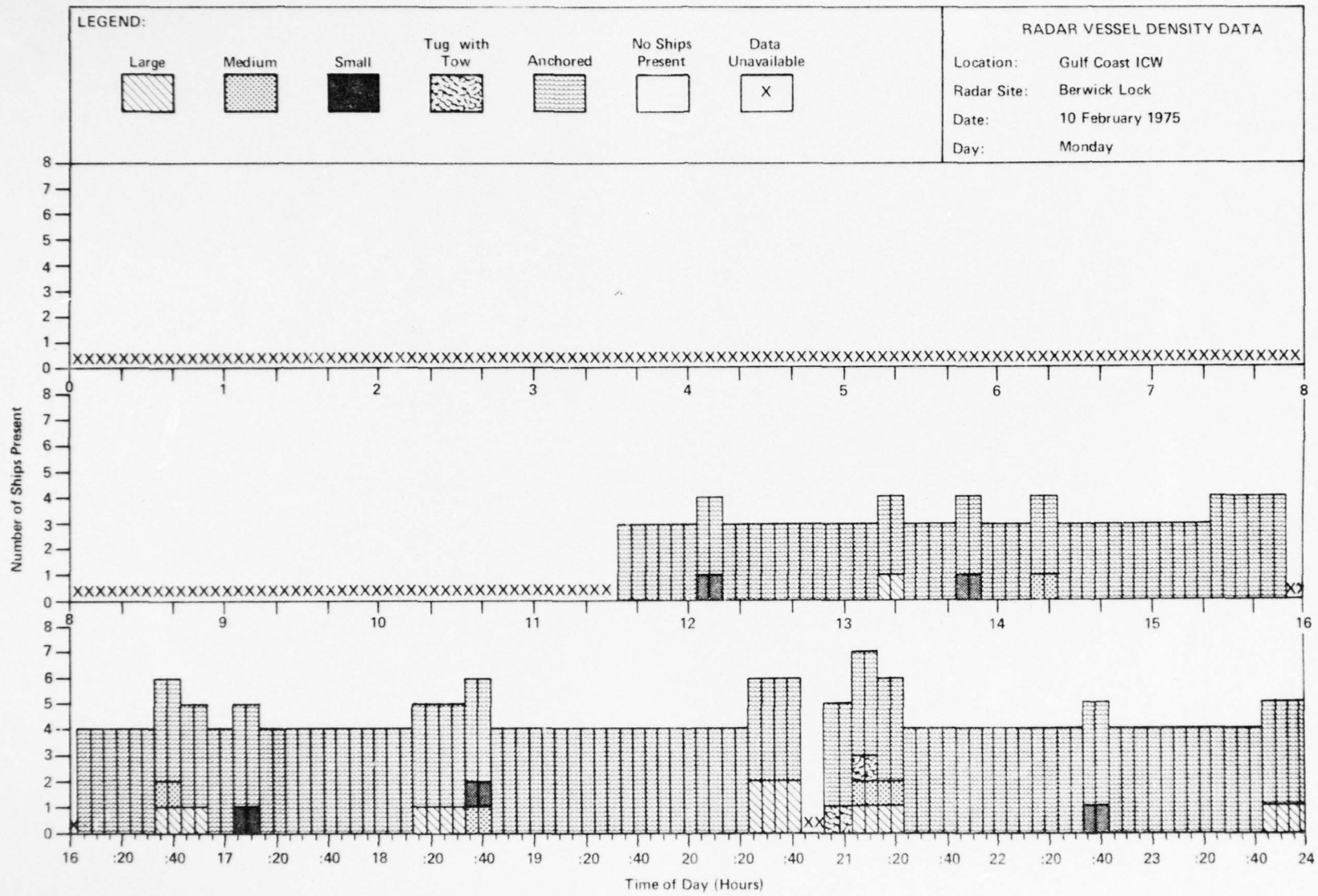

LEGEND:
Large
Medium
Small
Tug with Tow
Anchored
No Ships Present
Data Unavailable
X
RADAR VESSEL DENSITY DATA
Location: Gulf Coast ICW
Radar Site: Berwick Lock
Date: 5 February 1975
Day: Wednesday
Number of Ships Present
Time of Day (Hours)

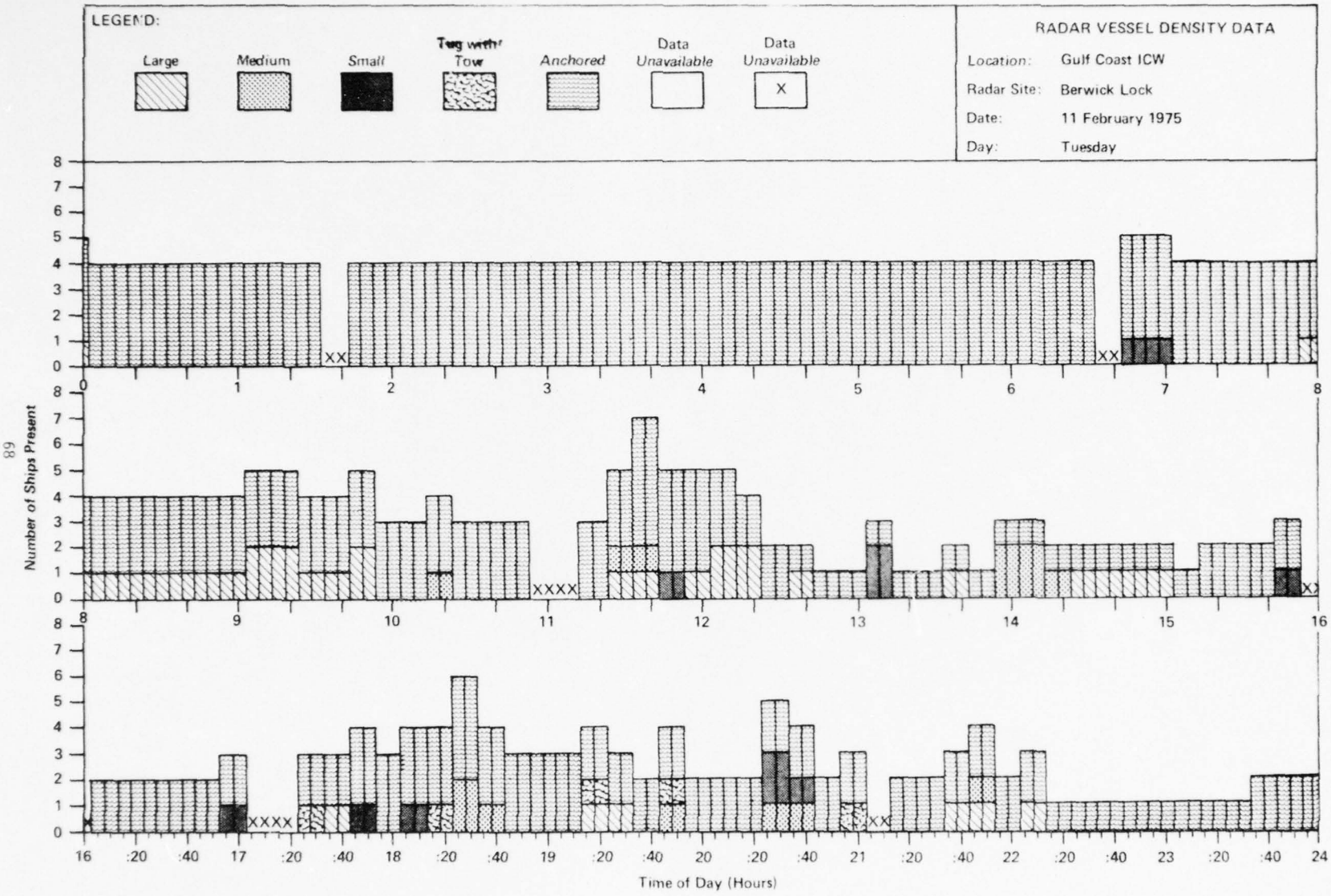

LEGEND:
Large
Medium
Small
Tug with Tow
Anchored
No Ships Present
Data Unavailable
X
RADAR VESSEL DENSITY DATA
Location: Gulf Coast ICW
Radar Site: Berwick Lock
Date: 6 February 1975
Day: Thursday
Number of Ships Present
Time of Day (Hours)

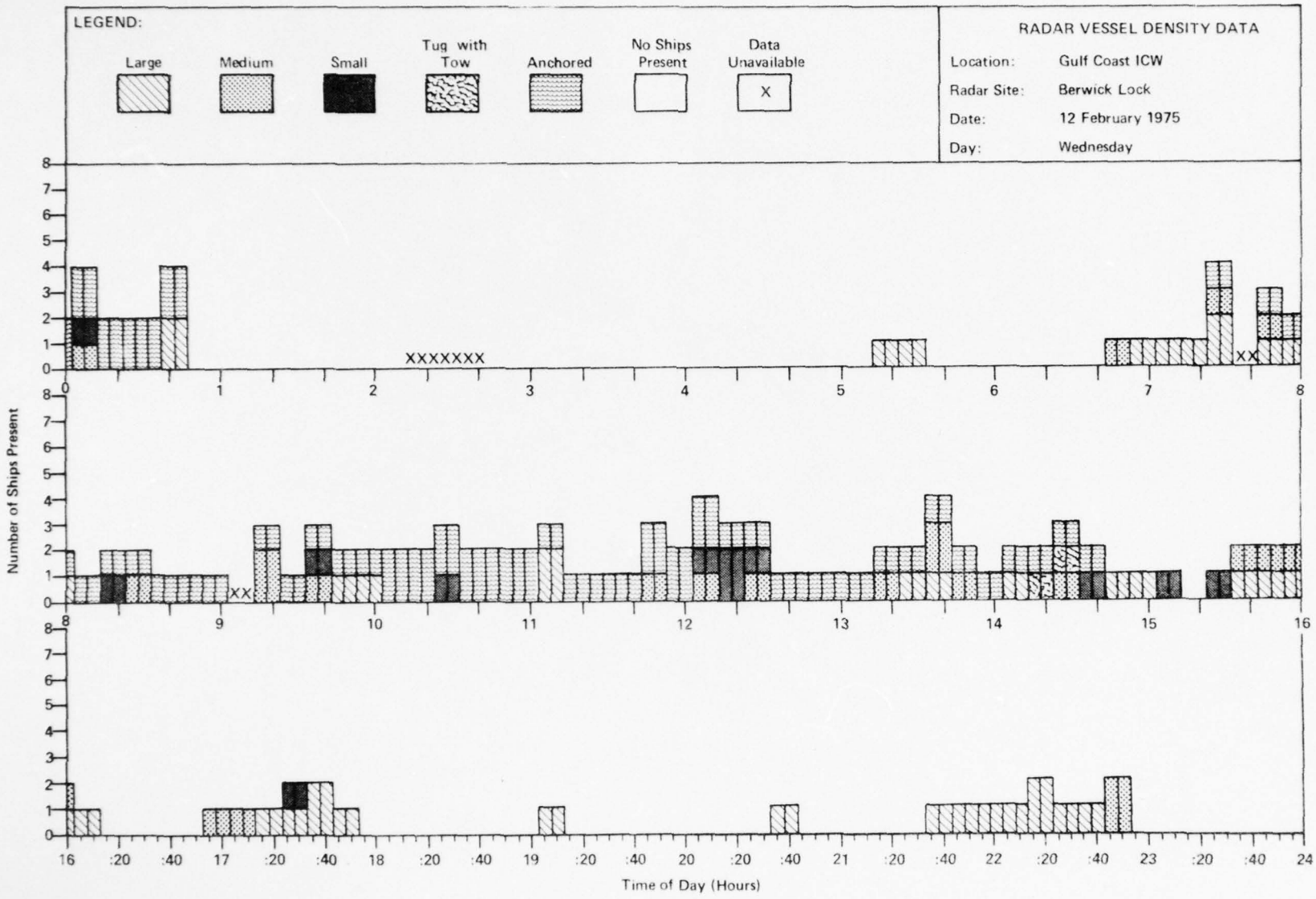

LEGEND:
Large
Medium
Small
Tug with Tow
Anchored
No Ships Present
Data Unavailable
X
RADAR VESSEL DENSITY DATA
Location: Gulf Coast ICW
Radar Site: Berwick Lock
Date: 7 February 1975
Day: Friday
Number of Ships Present
Time of Day (Hours)

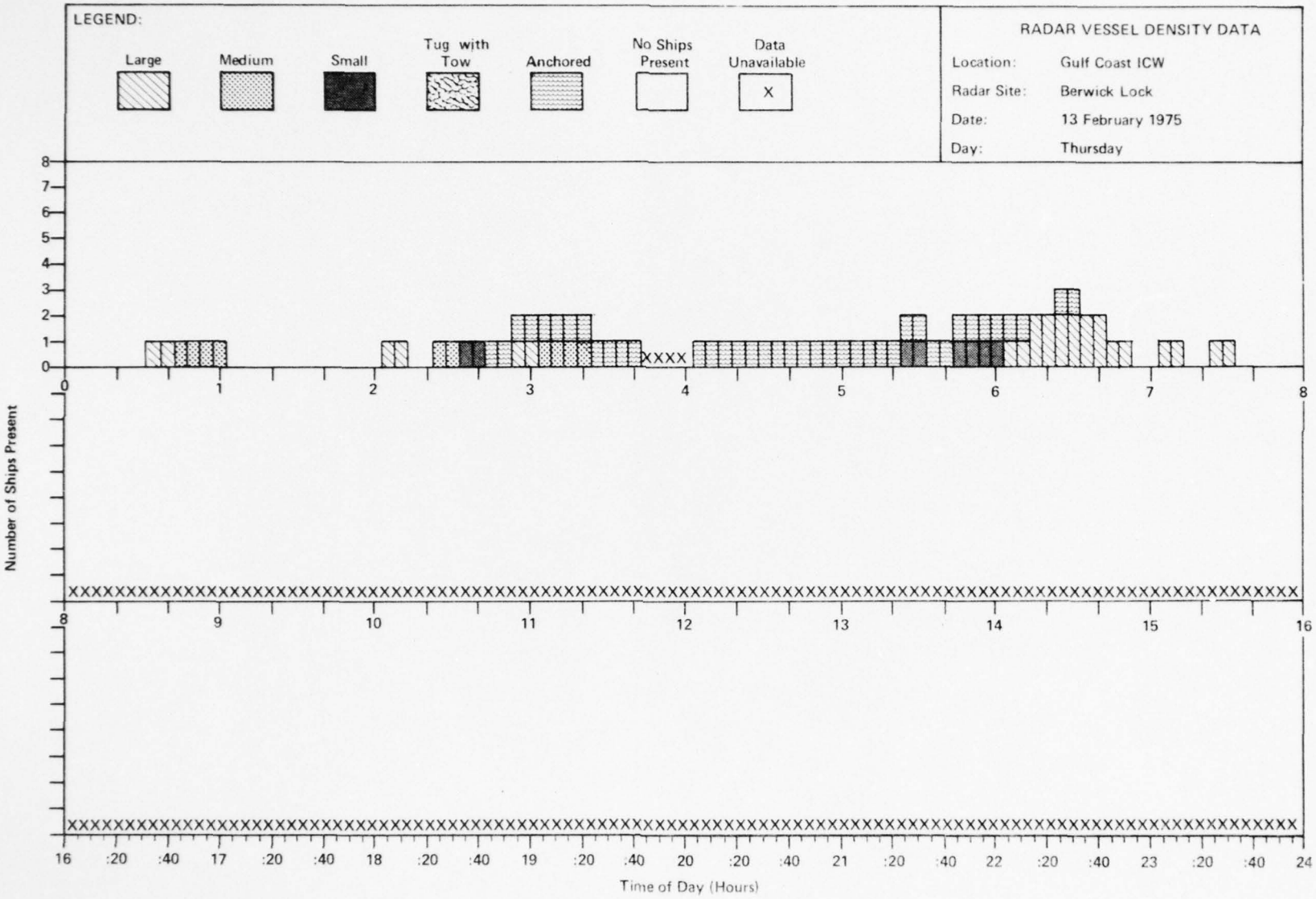

LEGEND:
Large
Medium
Small
Tug with Tow
Anchored
No Ships Present
Data Unavailable
X
RADAR VESSEL DENSITY DATA
Location: Gulf Coast ICW
Radar Site: Berwick Lock
Date: 8 February 1975
Day: Saturday
Number of Ships Present
Time of Day (Hours)

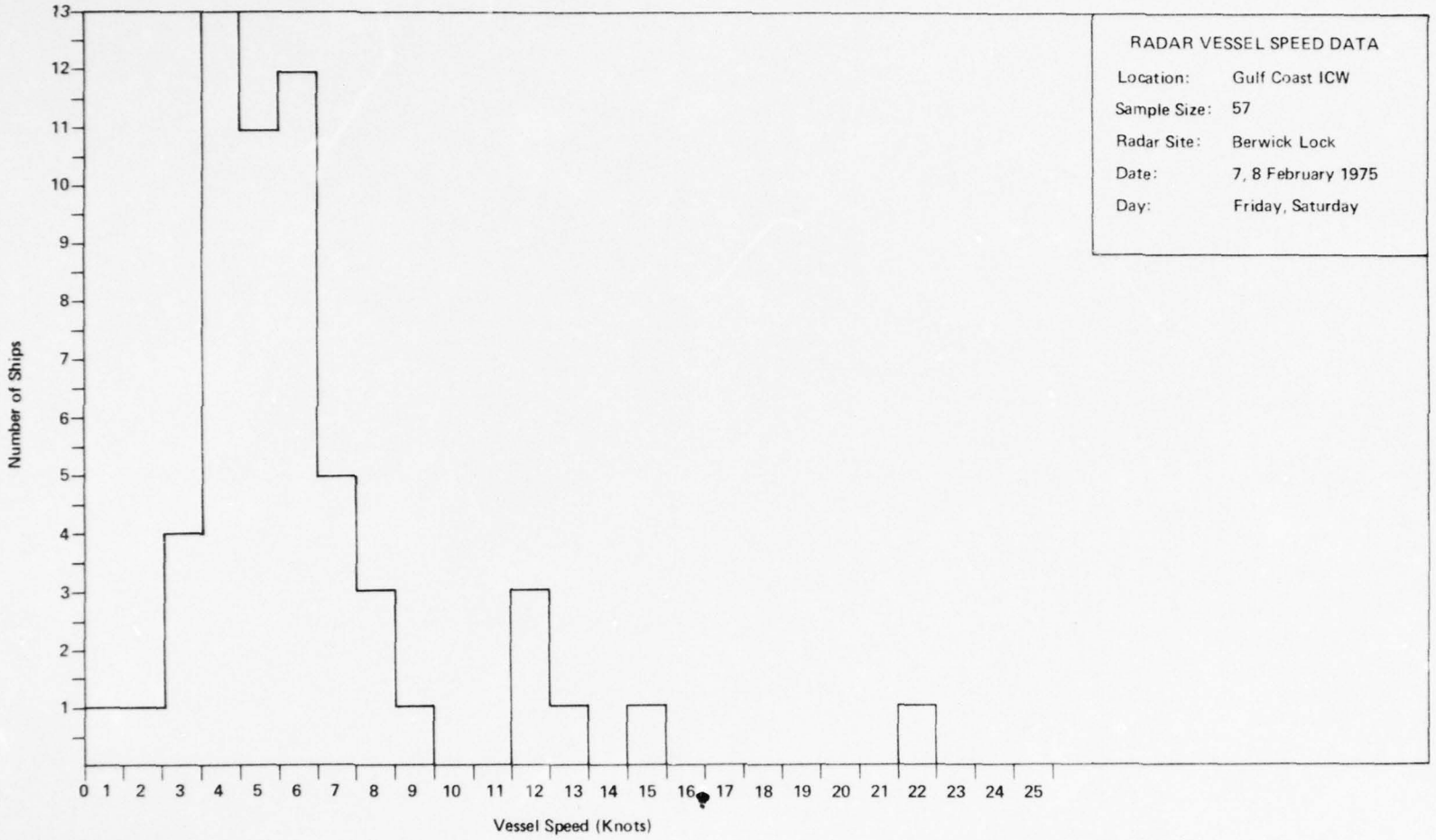

LEGEND:
Large
Medium
Small
Tug with Tow
Anchored
No Ships Present
Data Unavailable
X
RADAR VESSEL DENSITY DATA
Location: Gulf Coast ICW
Radar Site: Berwick Lock
Date: 9 February 1975
Day: Sunday
Number of Ships Present
Time of Day (Hours)

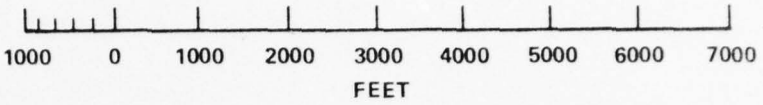

LEGEND:
Large
Medium
Small
Tug with Tow
Anchored
No Ships Present
Data Unavailable
X
RADAR VESSEL DENSITY DATA
Location: Gulf Coast ICW
Radar Site: Berwick Lock
Date: 10 February 1975
Day: Monday
Number of Ships Present
Time of Day (Hours)

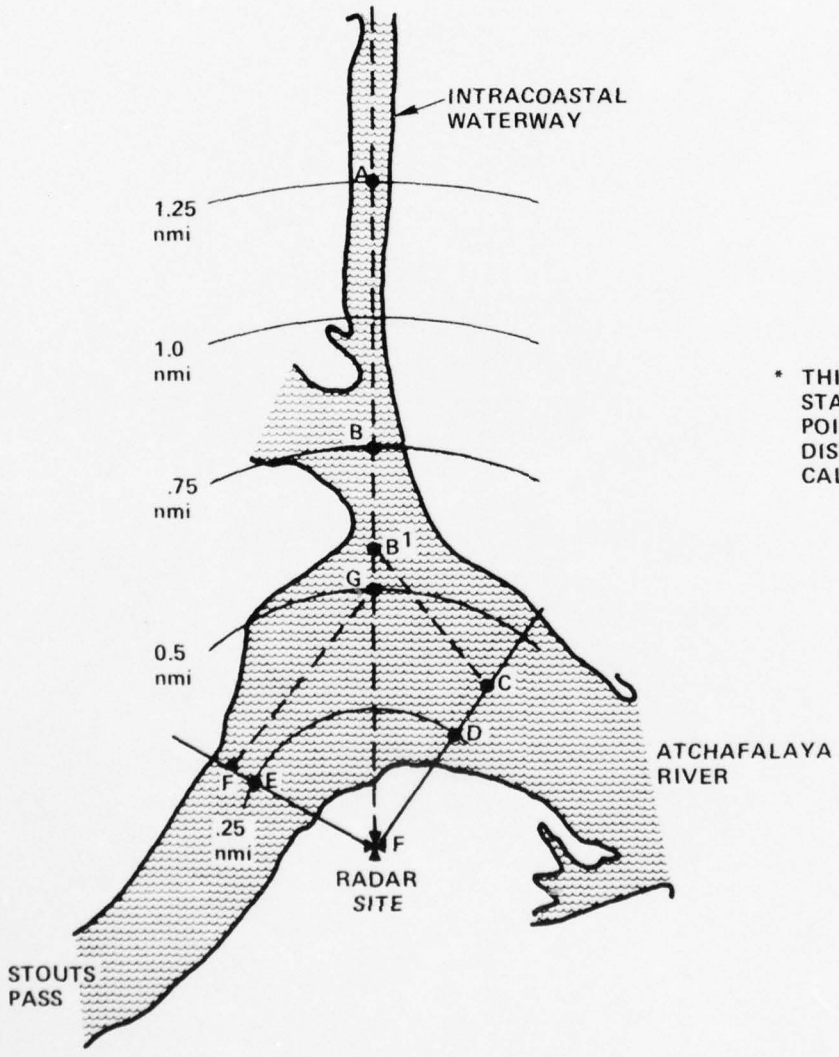

LEGEND:
Large
Medium
Small
Tug with Tow
Anchored
Data Unavailable
Data Unavailable
X
RADAR VESSEL DENSITY DATA
Location: Gulf Coast ICW
Radar Site: Berwick Lock
Date: 11 February 1975
Day: Tuesday
Number of Ships Present
Time of Day (Hours)


LEGEND:
Large
Medium
Small
Tug with Tow
Anchored
No Ships Present
Data Unavailable
X
RADAR VESSEL DENSITY DATA
Location: Gulf Coast ICW
Radar Site: Berwick Lock
Date: 12 February 1975
Day: Wednesday
Number of Ships Present
Time of Day (Hours)
XXXXXXX
XX
XX
XX


LEGEND:
Large
Medium
Small
Tug with Tow
Anchored
No Ships Present
Data Unavailable
X
RADAR VESSEL DENSITY DATA
Location: Gulf Coast ICW
Radar Site: Berwick Lock
Date: 13 February 1975
Day: Thursday
Number of Ships Present
Time of Day (Hours)


RADAR VESSEL SPEED DATA
Location: Gulf Coast ICW
Sample Size: 57
Radar Site: Berwick Lock
Date: 7, 8 February 1975
Day: Friday, Saturday
Number of Ships
Vessel Speed (Knots)
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
1 2 3 4 5 6 7 8 9 10 11 12 13





* THIS DIAGRAM SHOWS STARTING AND ENDING POINTS OF MEASURED DISTANCES USED IN CALCULATING SPEEDS.

SPEED CALCULATION TIMING POINTS FOR BERWICK LOCK*

SPEED DATA
FOR
BERWICK LOCK

Vessel No.	Vessel Size	Average Speed in Knots	Direction *	Day	Time Hour/Minute	
1	small	4	C-B	7 February 1975 Friday	06	42
2	small	4	C-A		06	58
3	large	5	A-C		06	58
4	small	5	C-A		07	40
5	large	8	A-C		07	57
6	large	1	A-C		08	05
7	medium	4	A-C		08	06
8	small	22	B-F		09	38
9	small	5	C-A		09	38
10	small	5	C-A		09	41
11	large	4	C-A		10	21
12	small	12	G-F		10	37
13	medium	5	B-C		11	41
14	medium	4	B-C		11	44
15	small	7	A-C		11	49
16	large	8	A-C		13	10
17	small	8	D-E		13	17
18	medium	4	B-C		13	39
19	medium	6	A-C		14	16
20	large	5	C-A		15	11
21	large	3	C-B		15	19
22	medium	4	C-A		15	30
23	Tug with Tow	3	C-A		16	16
24	small	12	E-D		16	26
25	small	7	C-A		16	56
26	large	4	C-A		17	02
27	large	7	A-C		17	07

* See Figure "Speed Calculation Timing Points for Berwick Lock"

SPEED DATA
FOR
BERWICK LOCK (Cont'd)

Vessel No.	Vessel Size	Average Speed in Knots	Direction*	Day	Time Hour/Minute	
28	small	4	A-C	7 February 1975 Friday	17	43
29	medium	3	B-C		17	45
30	large	5	C-A		20	01
31	large	6	A-C		20	19
32	small	7	A-C		20	39
33	small	6	A-C		20	42
34	small	5	D-E		16	06
35	small	6	D-E		16	12
36	small	15	E-D		16	25
37	medium	3	C-B		16	25
38	large	9	A-B		16	27
39	medium	13	E-D		16	31
40	large	5	A-C		17	02
41	large	6	A-C		17	08
42	medium	6	E-A		18	19
43	medium	6	E-A		18	21
44	small	5	D-E		18	33
45	small	7	B-C		18	35
46	small	6	A-C		18	41
47	small	12	E-D		18	56
48	Tug with Tow	6	C-A	7 February 1975 Friday	21	36
49	medium	2	D-E		21	58
50	medium	6	A-C	8 February 1975 Saturday	00	10
51	large	6	A-C		00	15
52	large	4	B-C		00	23
53	large	4	B-C		02	26
54	medium	6	A-C		02	44

* See Figure "Speed Calculation Timing Points for Berwick Lock"

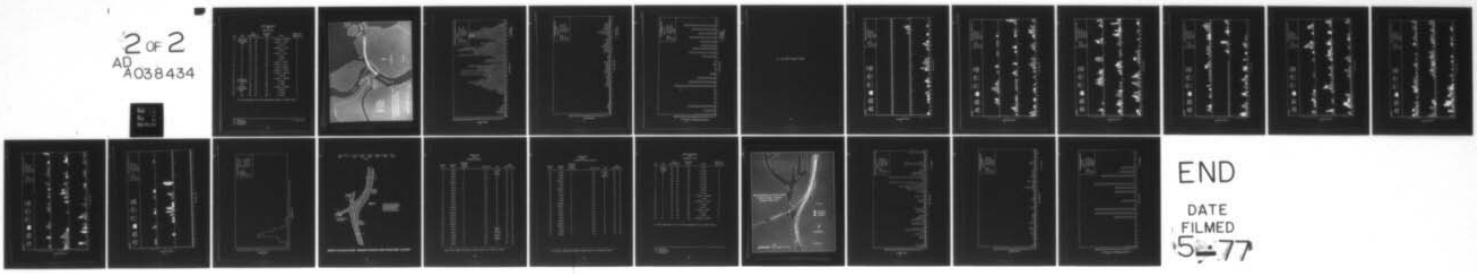
SPEED DATA
FOR
BERWICK LOCK (Cont'd)

Vessel No.	Vessel Size	Average Speed in Knots	Direction *	Day	Time Hour/Minute	
55	small	4	C-B	8 February 1975 Saturday	03	23
56	large	4	B-C		03	41
57	large	5	B-C		04	03

* See Figure "Speed Calculation Timing Points for Berwick Lock"

AD-A038 434 OPERATIONS RESEARCH INC SILVER SPRING MD F/G 15/5
VESSEL TRAFFIC DATA FOR GULF COAST INTRACOASTAL WATERWAY.(U)
MAR 76 L BUHLER, J STALEY, T NIGHTENGALE DOT-CG-31446-A
UNCLASSIFIED ORI-TR-1021 USCG-D-27-76 NL

2 OF 2
AD
A038434



END
DATE
FILMED
5-77

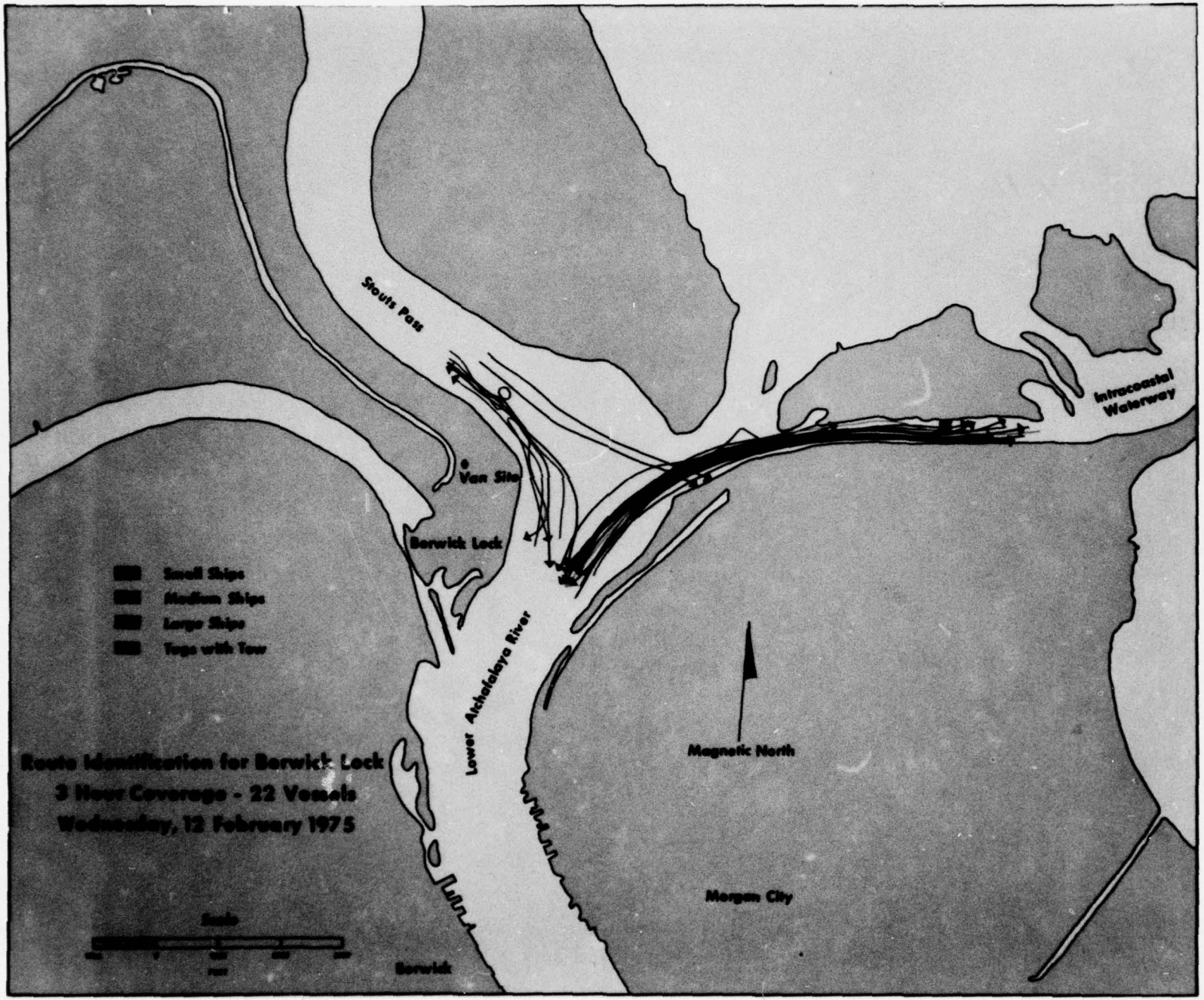
CLOSE ENCOUNTER
FOR
BERWICK LOCK

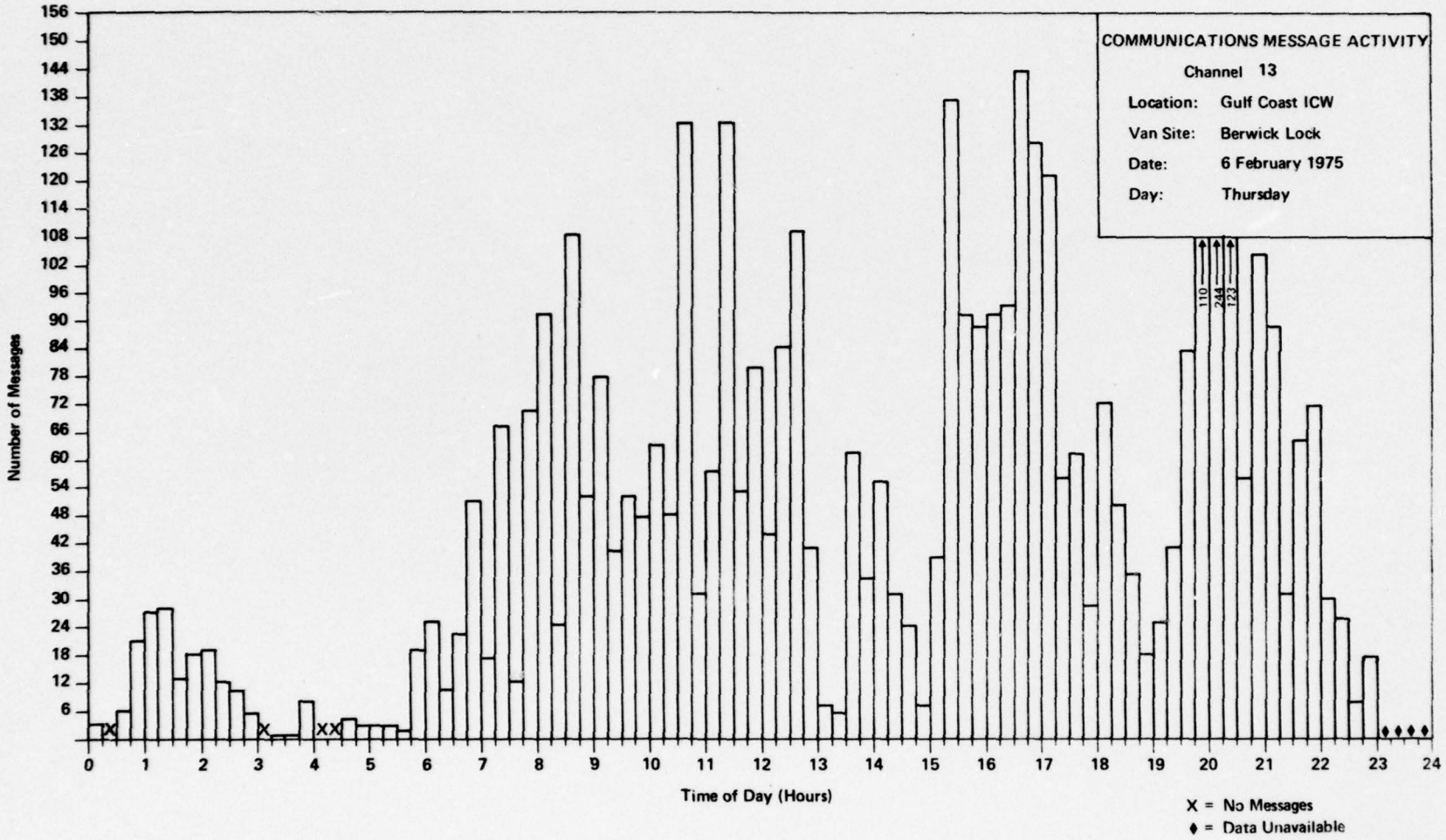
No.	Day	Time Hour	Time Minute	Distance Yards	Size	Manner of Approach*
1	Wednesday	07	30	113	1 large, 1 medium	P
2	12 February 1975	07	54	50	1 large, 1 small	P
3		08	00	53	2 large	P
4		09	18	80	1 medium, 1 small	P
5		09	37	50	2 small	P
6		10	26	70	1 large, 1 small	O
7		12	12	<50	2 small	P
8		12	25	50	2 small	P
9		13	33	63	1 large, 1 small	P
10		13	47	100	1 large, 1 small	P
11		14	29	30	1 tug, 1 medium	P
12		15	30	55	1 medium, 1 small	C
13		15	34	<38	1 large, 1 medium	P
14		15	37	<48	2 medium	P
15	Wednesday	15	44	63	1 large, 1 medium	P
16	12 February	17	44	64	2 large	P
17	1975	22	25	106	2 large	P
18	Thursday	00	26	95	1 large, 1 medium	P
19	13 February 1975	06	19	50	2 large	P
20		06	21	45	2 large	P
21	↓	06	34	150	2 large	P

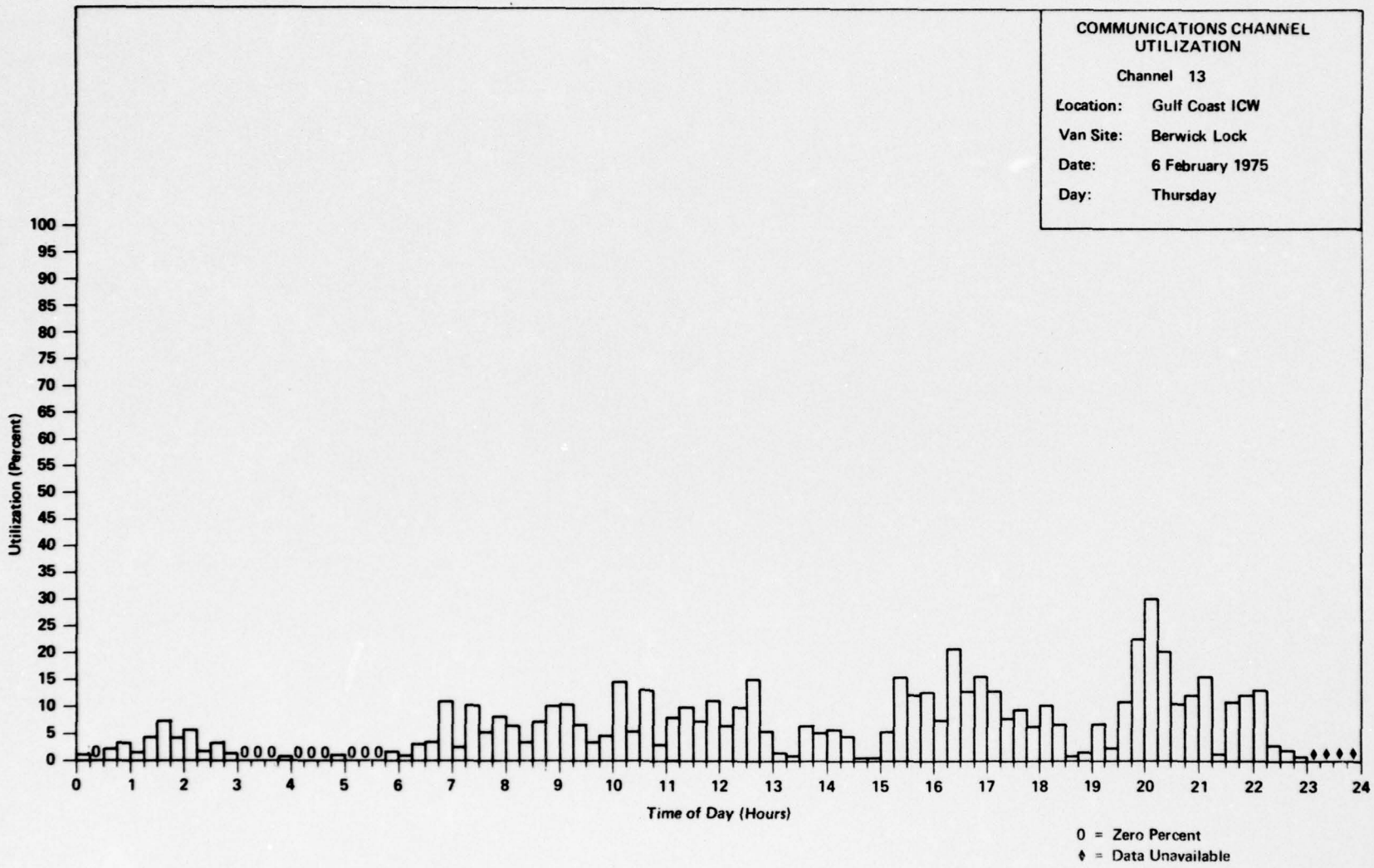
21 close encounters out of 28 encounters during a 24-hour period

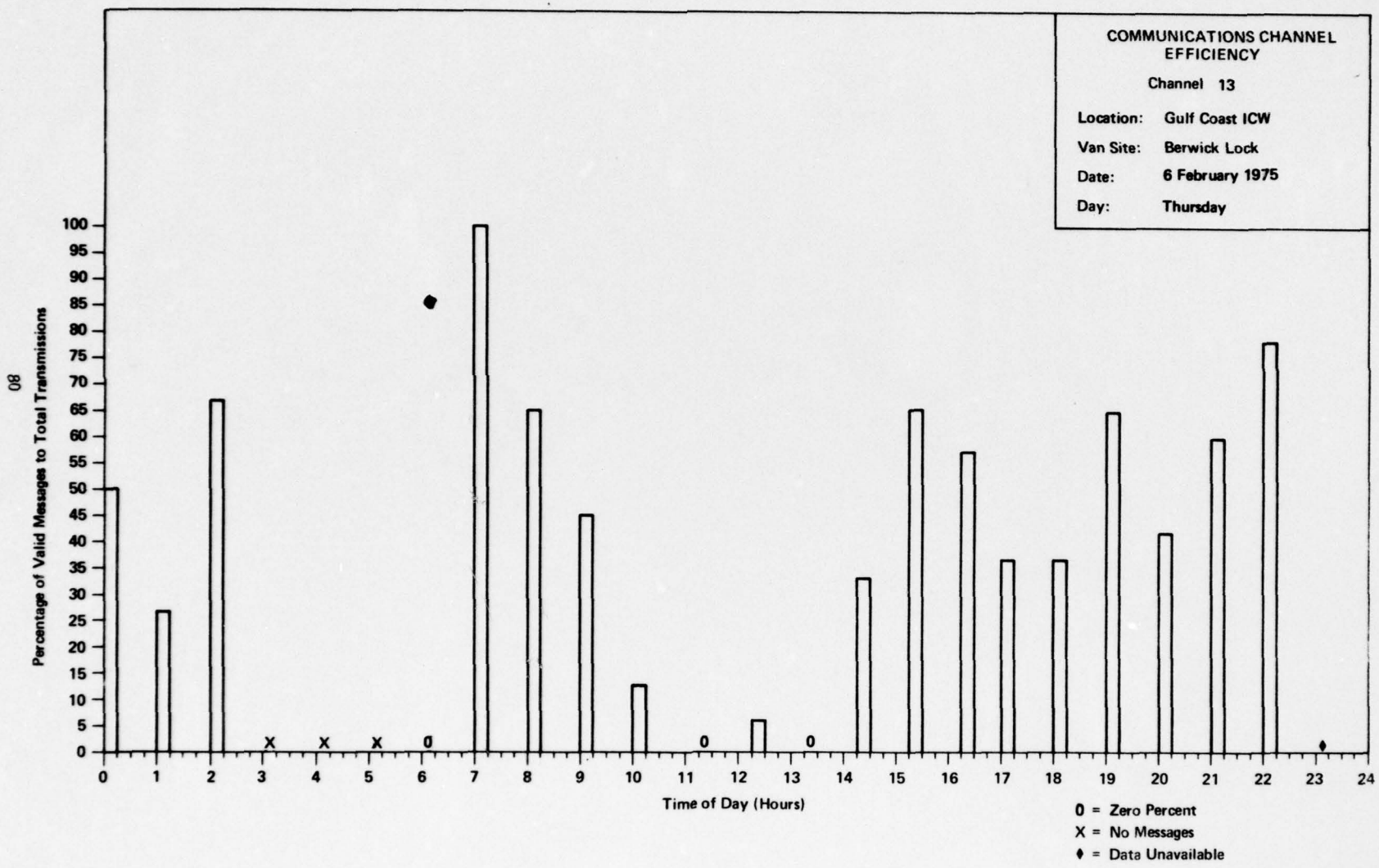
*P = Passing
O = Overtaking
C = Crossing

< = less than

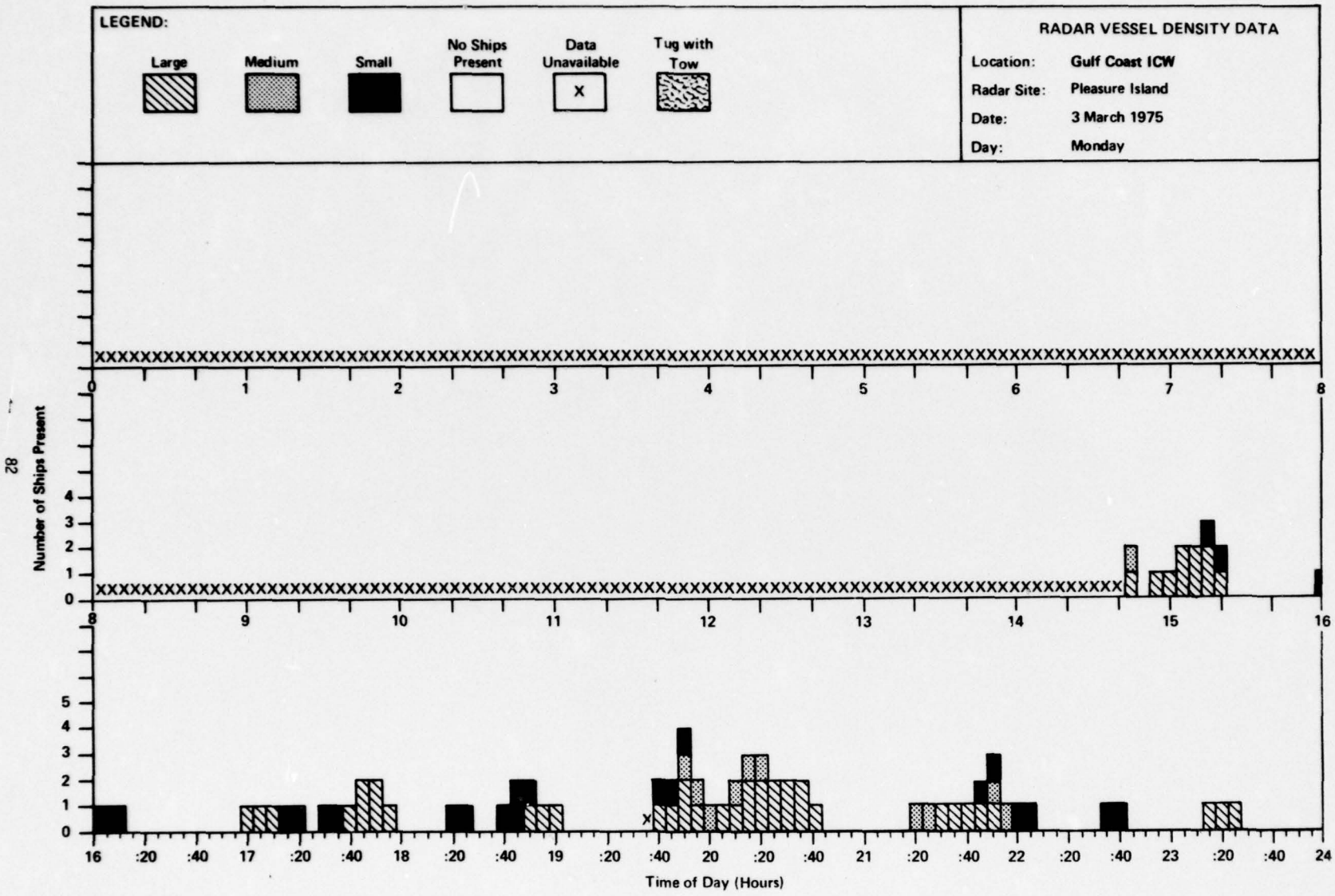

Stouts Pass
Intracoastal Waterway
Berwick Lock
Small Ships
Medium Ships
Large Ships
Tugs with Tow
Lower Atchafalaya River
Magnetic North
Route Identification for Berwick Lock
3 Hour Coverage - 22 Vessels
Wednesday, 12 February 1975
Scale
Berwick
Morgan City

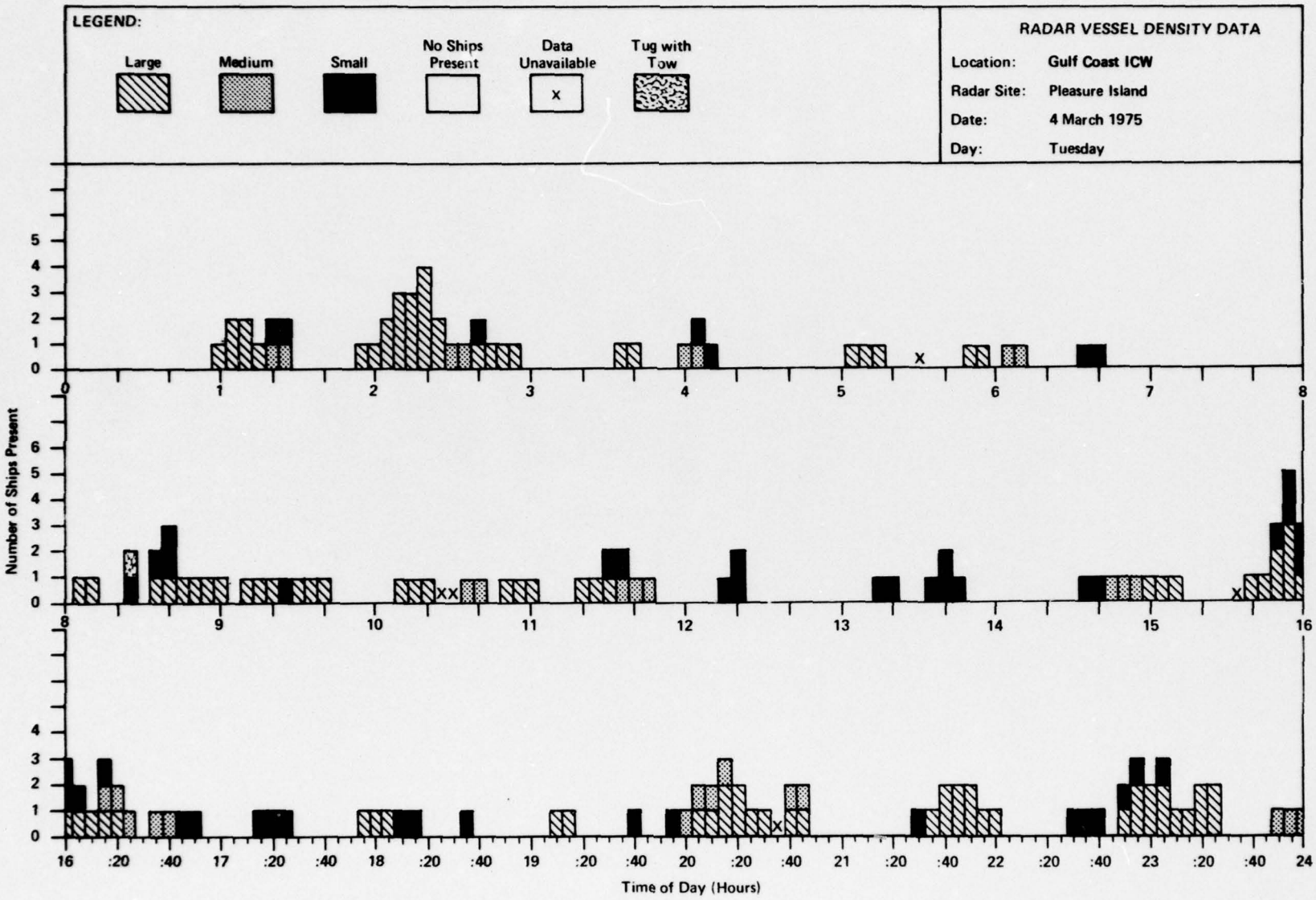

COMMUNICATIONS MESSAGE ACTIVITY
Channel 13
Location: Gulf Coast ICW
Van Site: Berwick Lock
Date: 6 February 1975
Day: Thursday
Number of Messages
Time of Day (Hours)
110
244
123
X = No Messages
♦ = Data Unavailable

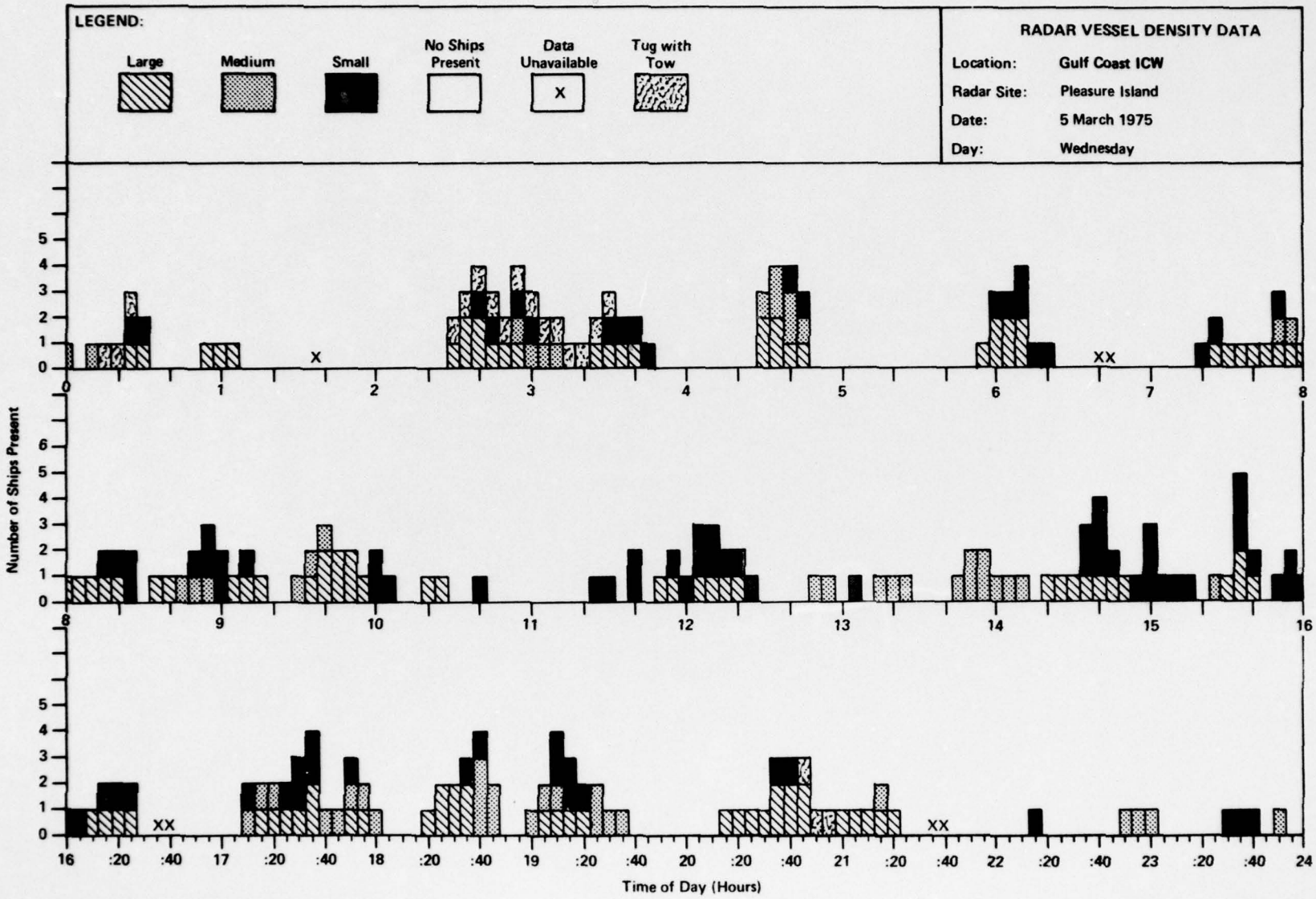

COMMUNICATIONS CHANNEL UTILIZATION
Channel 13
Location: Gulf Coast ICW
Van Site: Berwick Lock
Date: 6 February 1975
Day: Thursday
Utilization (Percent)
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Time of Day (Hours)
0 = Zero Percent
♦ = Data Unavailable

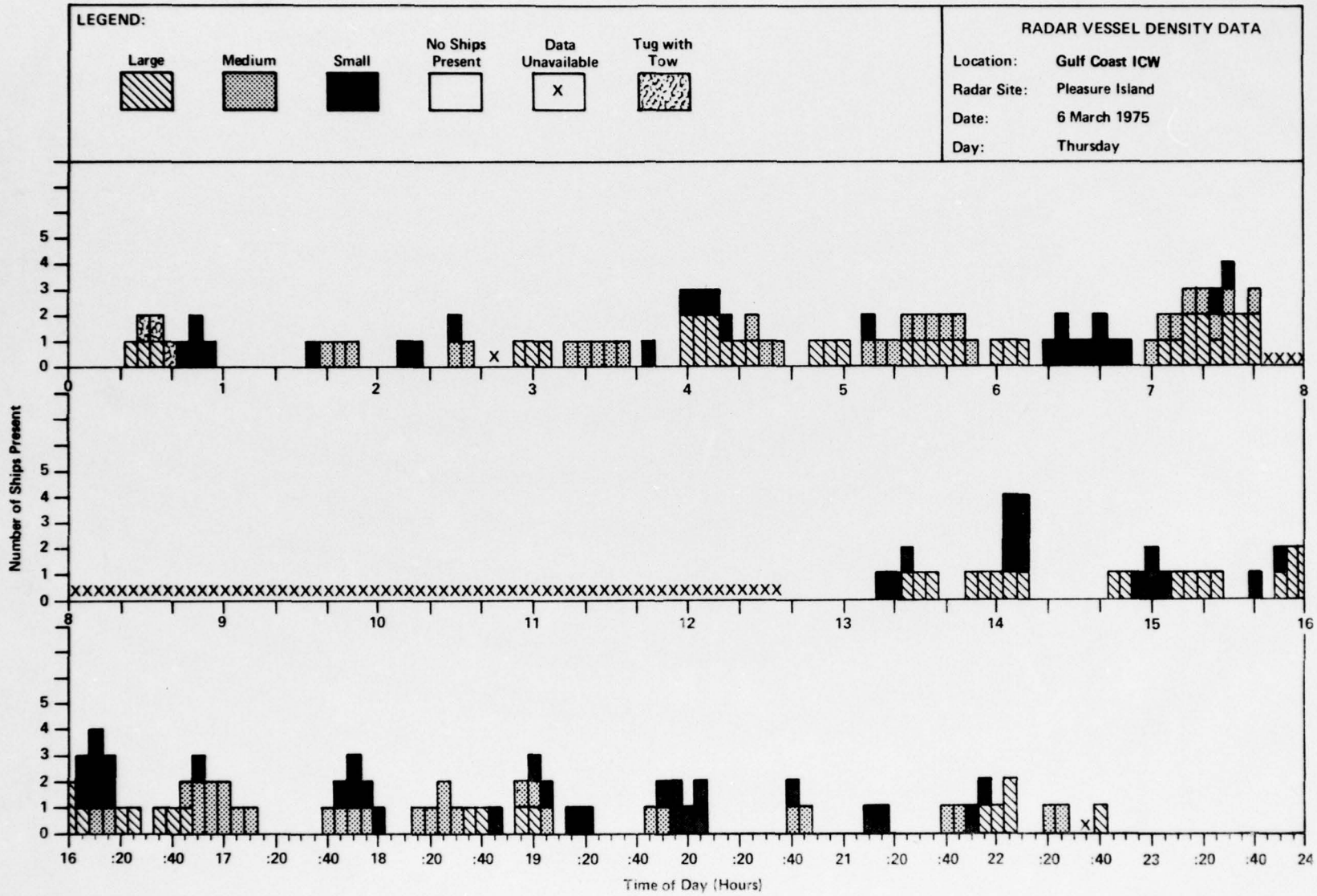

COMMUNICATIONS CHANNEL EFFICIENCY
Channel 13
Location: Gulf Coast ICW
Van Site: Berwick Lock
Date: 6 February 1975
Day: Thursday
Percentage of Valid Messages to Total Transmissions
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
X
X
X
0
0
0
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Time of Day (Hours)
0 = Zero Percent
X = No Messages
♦ = Data Unavailable

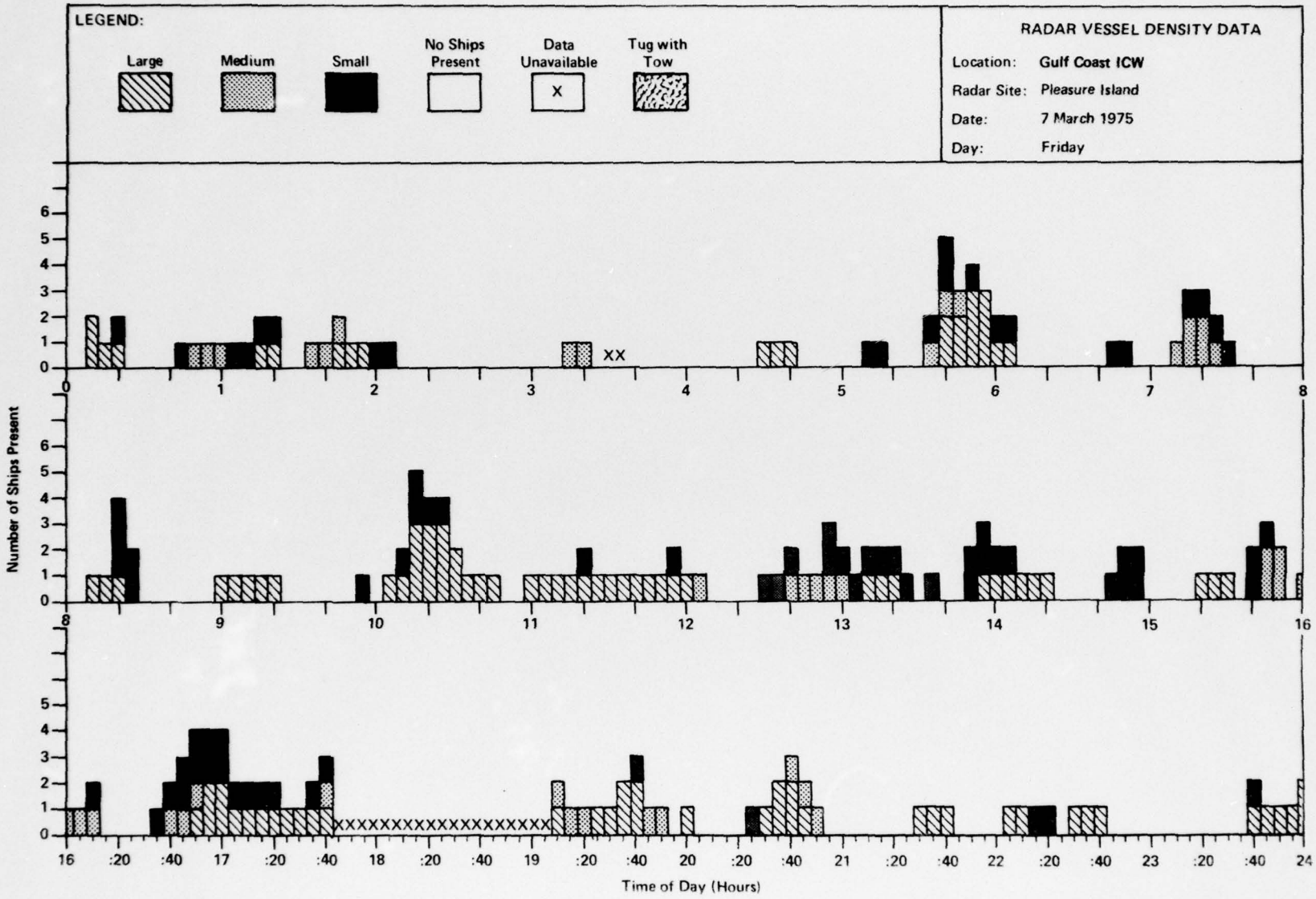
2.4 DATA FROM PLEASURE ISLAND

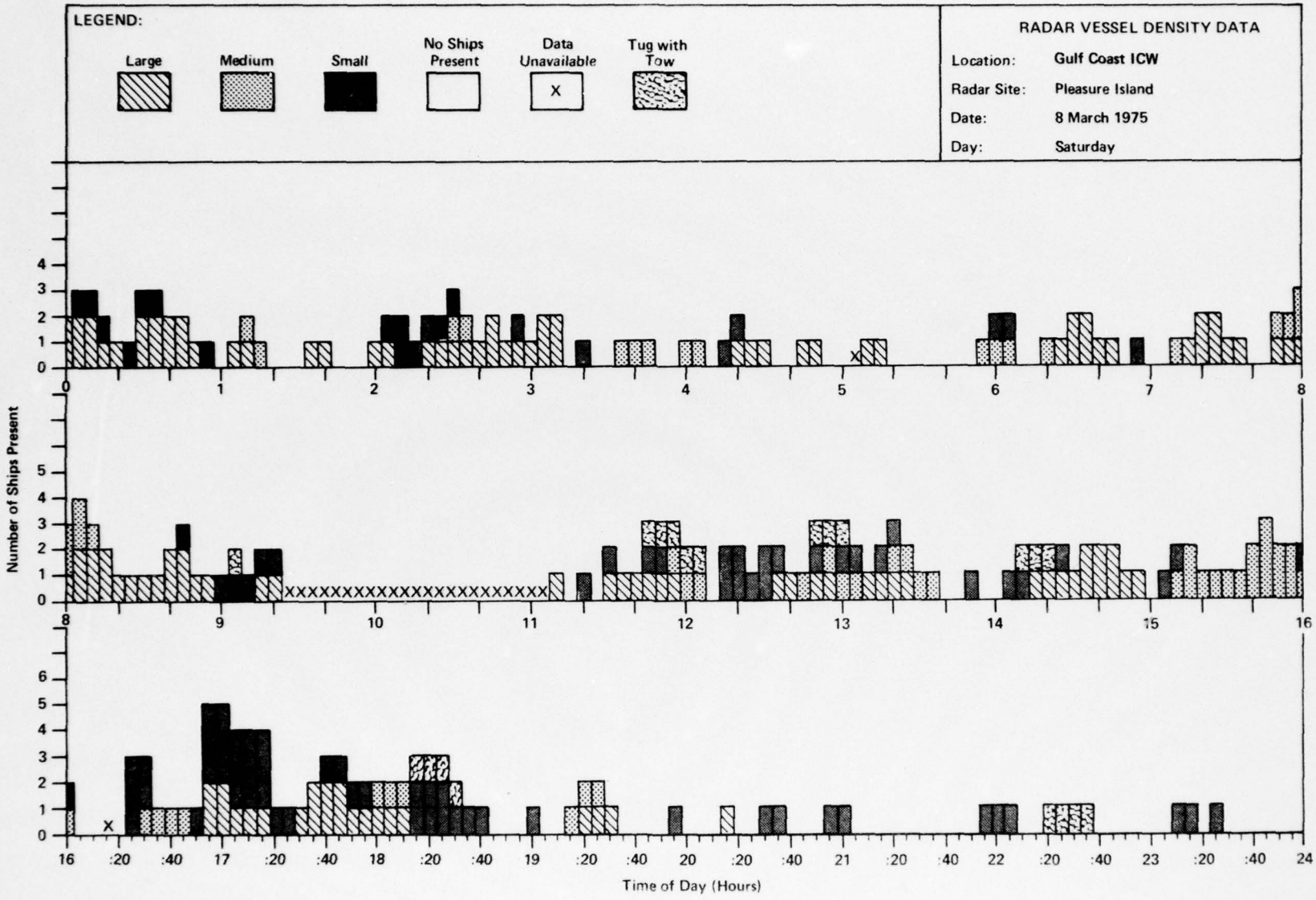

LEGEND:
Large
Medium
Small
No Ships Present
Data Unavailable
X
Tug with Tow
RADAR VESSEL DENSITY DATA
Location: Gulf Coast ICW
Radar Site: Pleasure Island
Date: 3 March 1975
Day: Monday
Number of Ships Present
Time of Day (Hours)
0 1 2 3 4 5 6 7 8
8 9 10 11 12 13 14 15 16
16 :20 :40 17 :20 :40 18 :20 :40 19 :20 :40 20 :20 :40 21 :20 :40 22 :20 :40 23 :20 :40 24

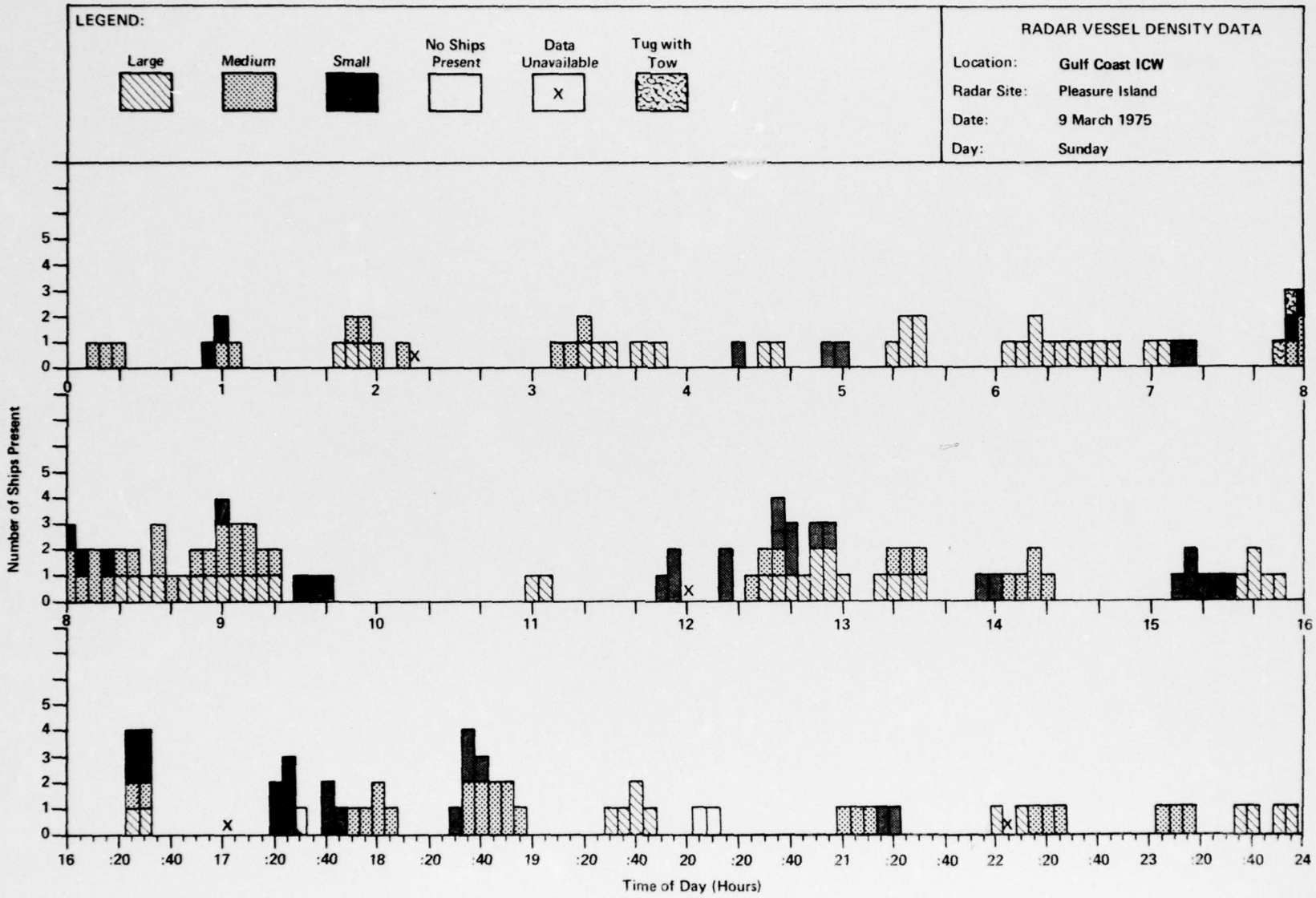

LEGEND:
Large
Medium
Small
No Ships Present
Data Unavailable
Tug with Tow
RADAR VESSEL DENSITY DATA
Location: Gulf Coast ICW
Radar Site: Pleasure Island
Date: 4 March 1975
Day: Tuesday
Number of Ships Present
Time of Day (Hours)

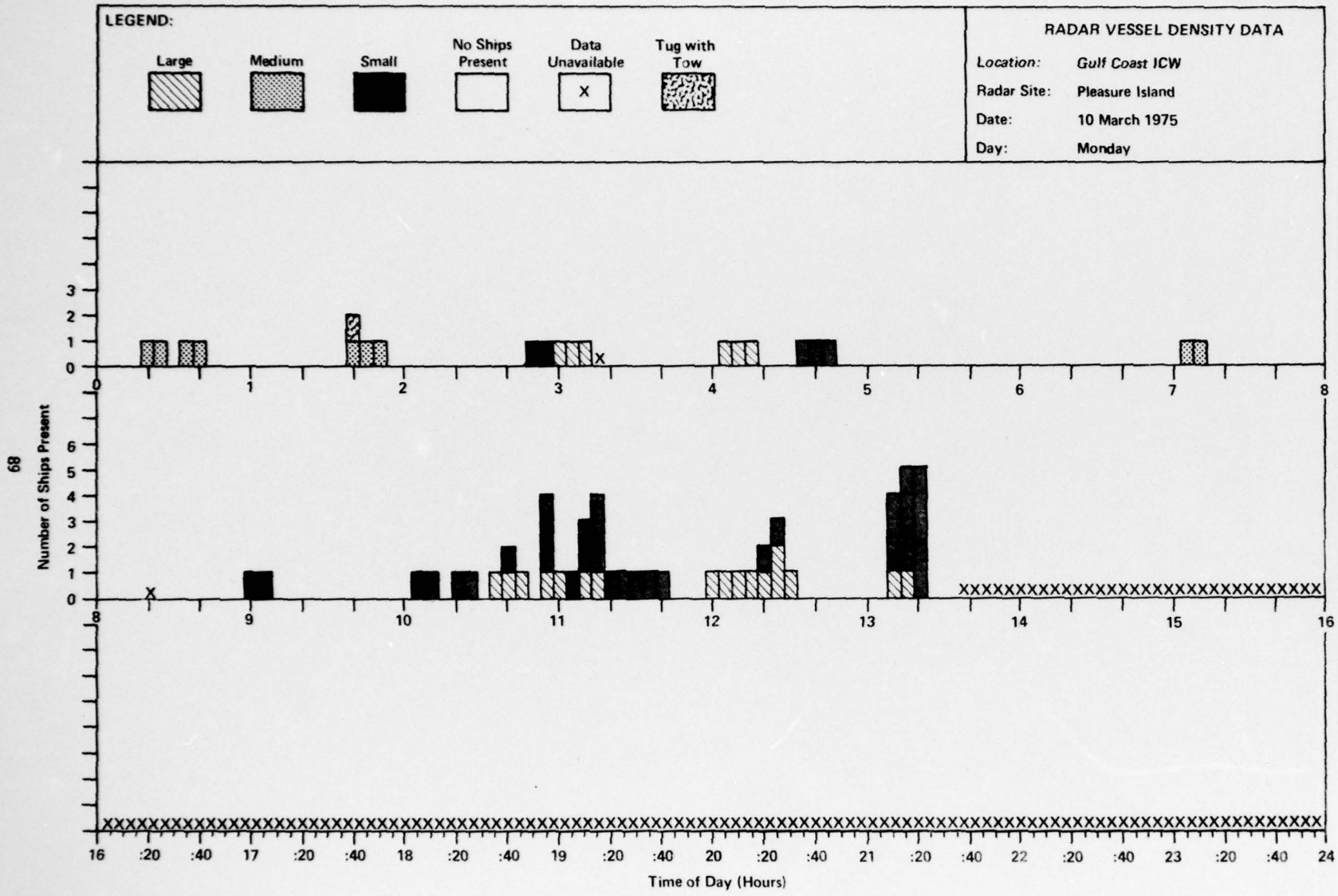

LEGEND:
Large
Medium
Small
No Ships Present
Data Unavailable
X
Tug with Tow
RADAR VESSEL DENSITY DATA
Location: Gulf Coast ICW
Radar Site: Pleasure Island
Date: 5 March 1975
Day: Wednesday
Number of Ships Present
Time of Day (Hours)

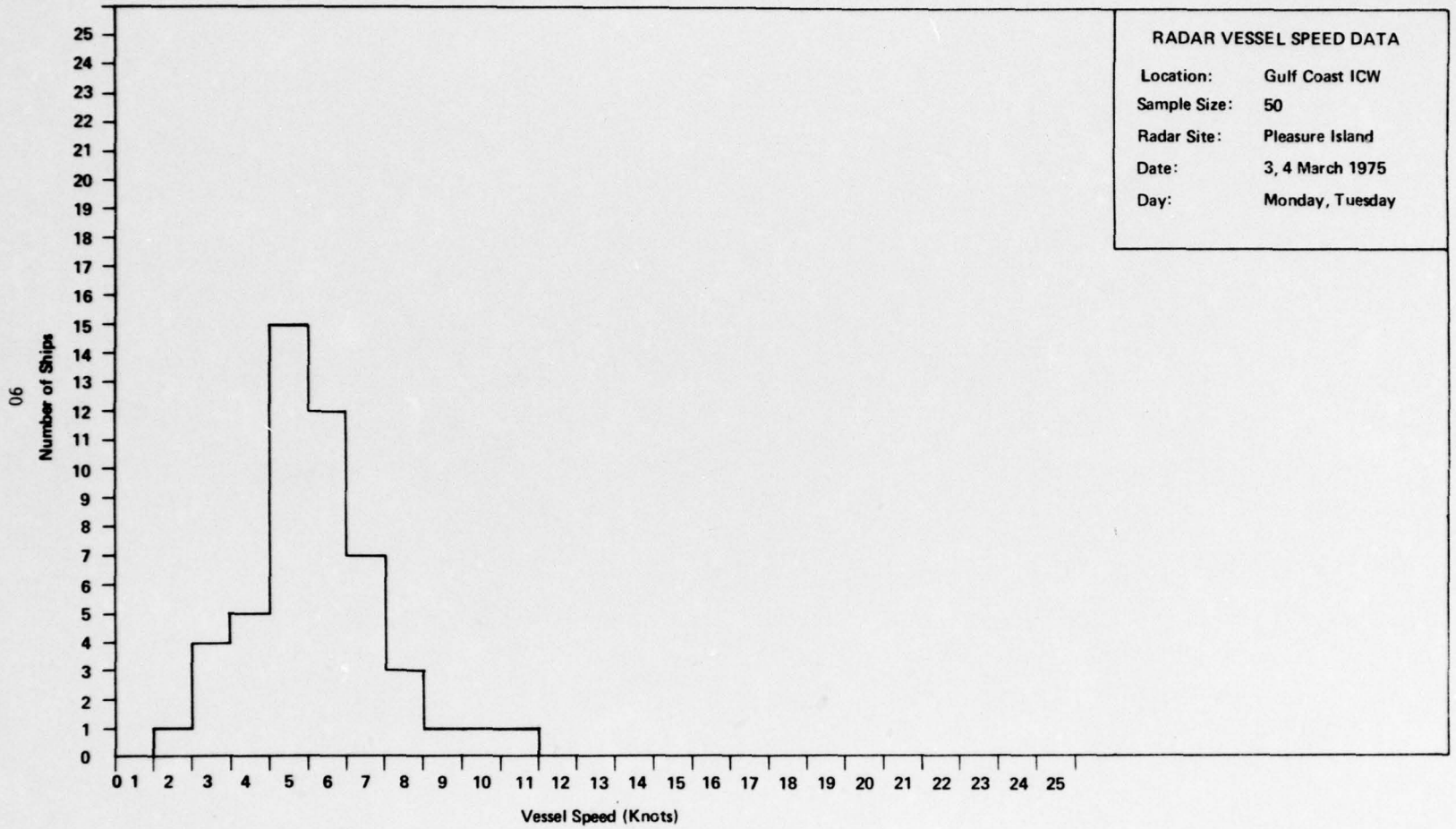

LEGEND:
Large
Medium
Small
No Ships Present
Data Unavailable
Tug with Tow
RADAR VESSEL DENSITY DATA
Location: Gulf Coast ICW
Radar Site: Pleasure Island
Date: 6 March 1975
Day: Thursday
Number of Ships Present
Time of Day (Hours)

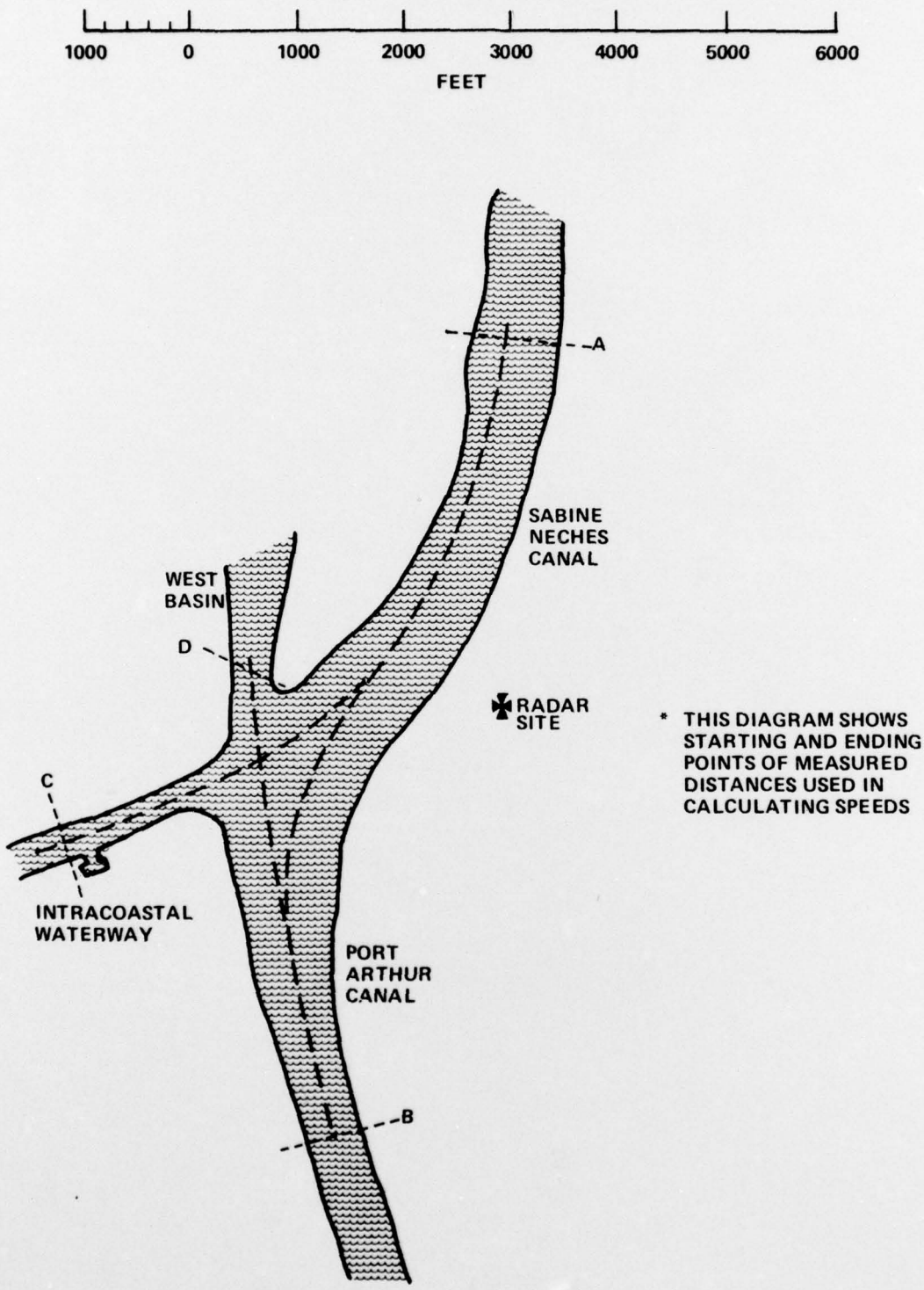

LEGEND:
Large
Medium
Small
No Ships Present
Data Unavailable
X
Tug with Tow
RADAR VESSEL DENSITY DATA
Location: Gulf Coast ICW
Radar Site: Pleasure Island
Date: 7 March 1975
Day: Friday
Number of Ships Present
XX
XXXXXXXXXXXXXXXXXXX
Time of Day (Hours)


LEGEND:
Large
Medium
Small
No Ships Present
Data Unavailable
X
Tug with Tow
RADAR VESSEL DENSITY DATA
Location: Gulf Coast ICW
Radar Site: Pleasure Island
Date: 8 March 1975
Day: Saturday
Number of Ships Present
Time of Day (Hours)


LEGEND:
Large
Medium
Small
No Ships Present
Data Unavailable
Tug with Tow
RADAR VESSEL DENSITY DATA
Location: Gulf Coast ICW
Radar Site: Pleasure Island
Date: 9 March 1975
Day: Sunday
Number of Ships Present
Time of Day (Hours)


LEGEND:
Large
Medium
Small
No Ships Present
Data Unavailable
Tug with Tow
RADAR VESSEL DENSITY DATA
Location: Gulf Coast ICW
Radar Site: Pleasure Island
Date: 10 March 1975
Day: Monday
Number of Ships Present
Time of Day (Hours)


RADAR VESSEL SPEED DATA
Location: Gulf Coast ICW
Sample Size: 50
Radar Site: Pleasure Island
Date: 3, 4 March 1975
Day: Monday, Tuesday
Number of Ships
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
Vessel Speed (Knots)



SPEED CALCULATION TIMING POINTS FOR PLEASURE ISLAND*

SPEED DATA
FOR
PLEASURE ISLAND

Vessel No.	Vessel Size	Average Speed in Knots	Direction *	Day	Time Hour/Minute	
1	large	3	A-C	3 March 1975 Monday	14	53
2	large	3	C-A		15	01
3	small	7	A-C		15	13
4	small	6	A-B		15	51
5	medium	6	A-C		16	59
6	small	7	A-B		17	13
7	large	10	B-A		17	36
8	large	6	D-B		17	42
9	large	7	B-A		17	45
10	small	8	B-A		18	35
11	small	5	C-B		18	39
12	large	4	C-A		18	44
13	large	7	A-C		19	46
14	medium	4	A-C		19	49
15	large	5	A-C		15	00
16	medium	5	A-B		20	05
17	medium	5	C-A		21	16
18	medium	2	A-D		21	26
19	small	7	A-D		21	43
20	medium	6	A-C		21	45
21	small	8	A-D		21	59
22	small	5	C-B	3 March 1975 Monday	22	30
23	large	6	C-A		23	13
24	large	6	A-C	4 March 1975 Tuesday	00	59
25	large	5	A-C		01	05
26	small	5	D-A		01	16
27	small	5	B-C		01	18

* See Figure "Speed Calculation Timing Points for Pleasure Island"

SPEED DATA
FOR
PLEASURE ISLAND (Cont'd)

Vessel No.	Vessel Size	Average Speed in Knots	Direction*	Day	Time Hour/Minute	
28	large	3	C-A	4 March 1975 Tuesday	02	02
29	large	5	C-A		02	06
30	large	7	C-A		02	19
31	medium	5	A-B		02	25
32	large	3	C-A		02	37
33	large	6	A-C		03	31
34	medium	5	A-D		03	59
35	small	6	C-B		04	04
36	large	5	A-C		05	04
37	large	4	A-C		10	45
38	large	6	A-B		11	18
39	medium	4	D-A		11	26
40	medium	4	A-D		11	32
41	small	11	C-A		12	13
42	small	6	D-A		12	16
43	small	6	A-D		12	17
44	small	9	A-D		13	14
45	small	7	A-C		13	38
46	medium	5	D-B		14	32
47	medium	6	B-A		14	41
48	large	5	C-A		14	59
49	small	5	B-A		15	47
50	medium	8	C-A		15	48

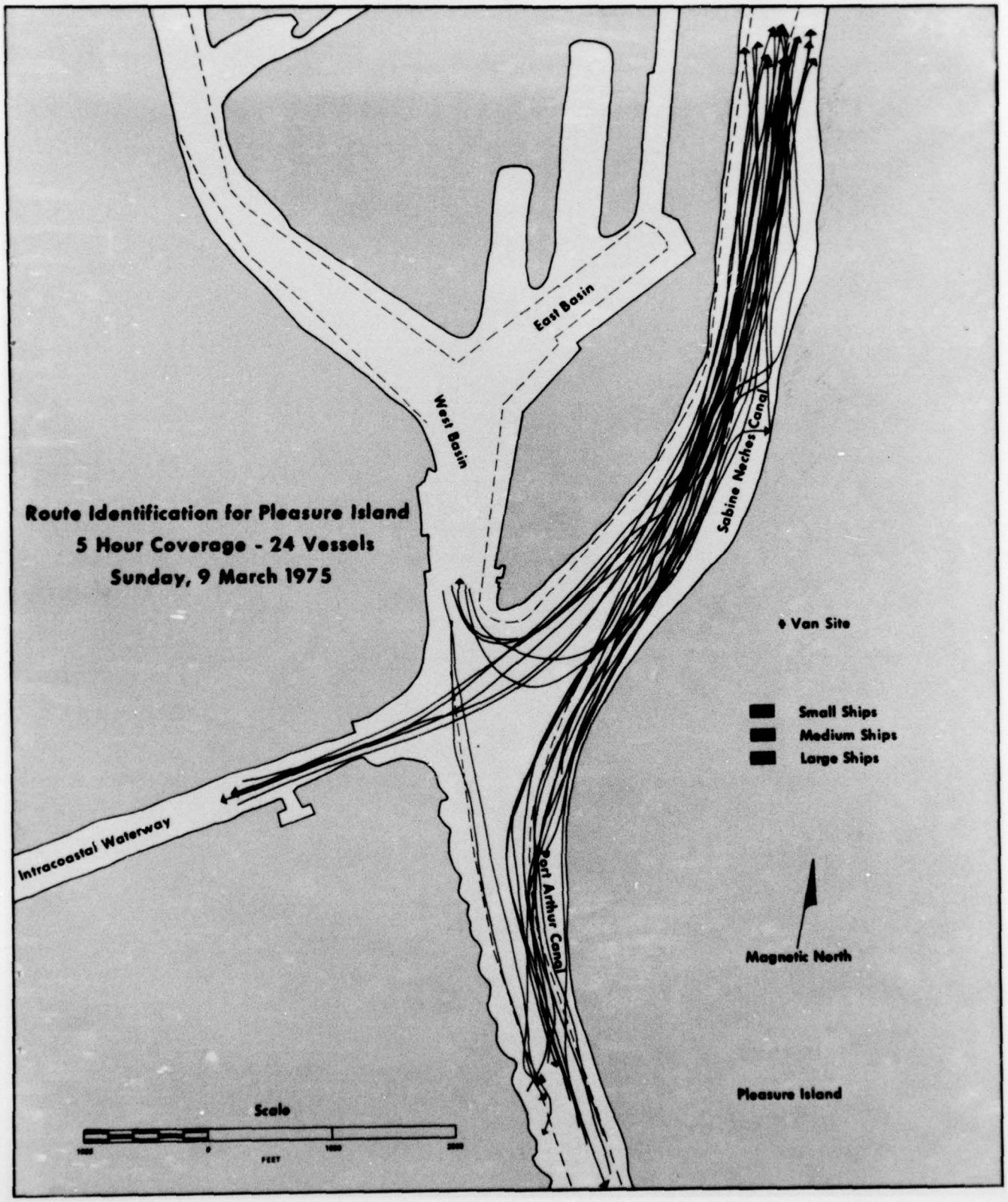
* See Figure "Speed Calculation Timing Points for Pleasure Island"

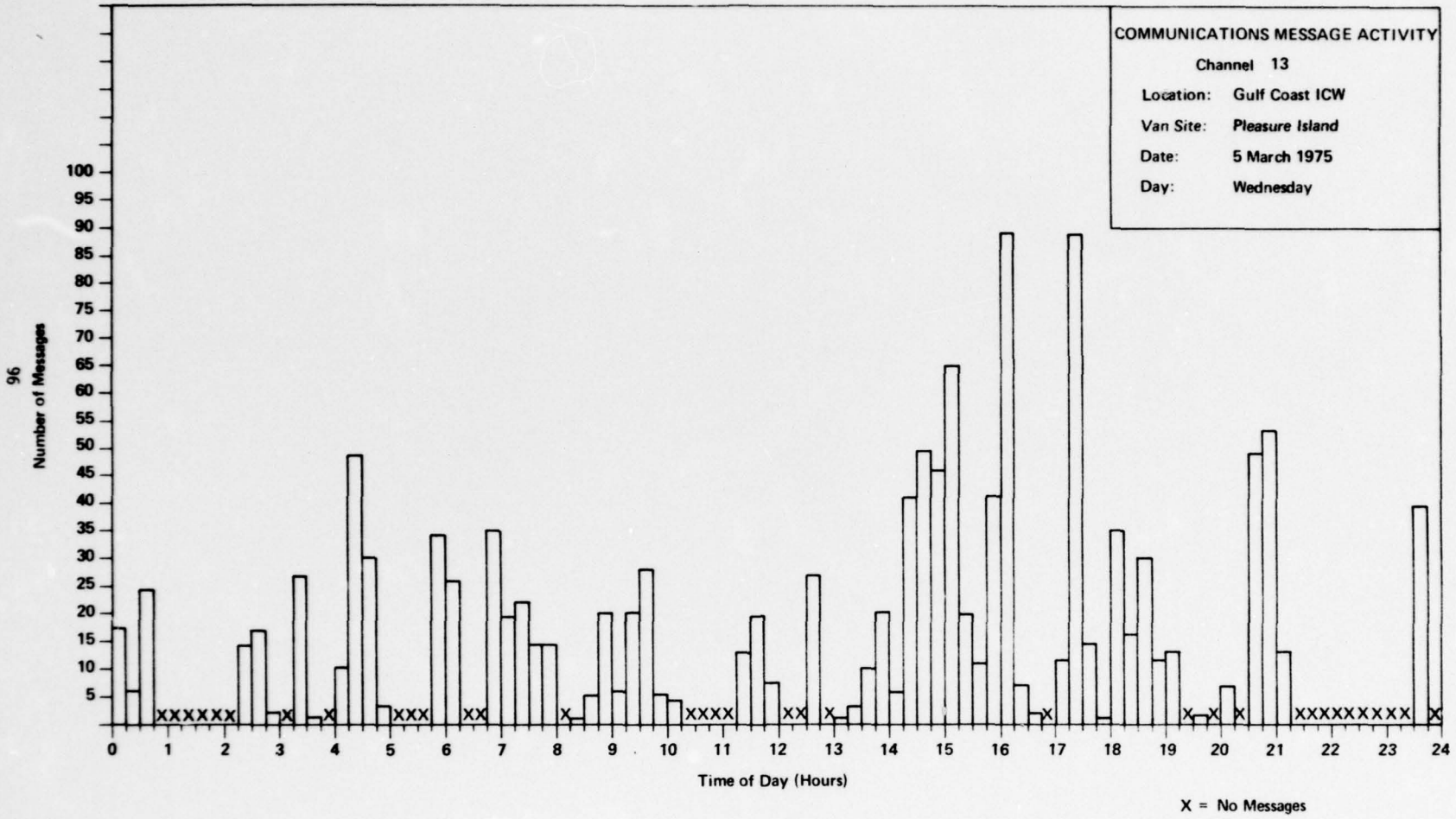
CLOSE ENCOUNTER
FOR
PLEASURE ISLAND

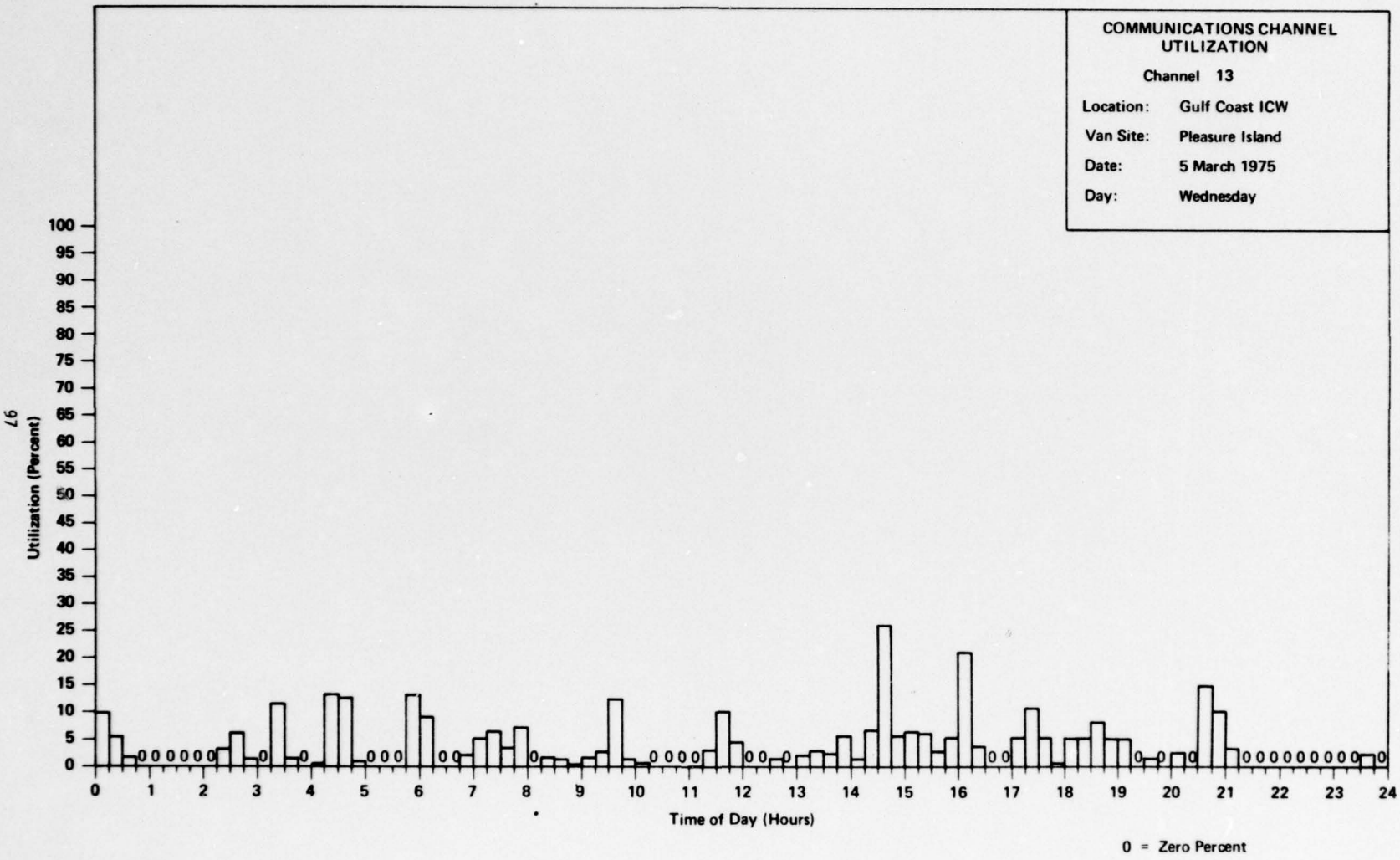
No.	Day	Time Hour/Minute		Distance Yards	Size	Manner of Approach*
1	Sunday 9 March 1975	01	53	56	2 large	P
2		07	56	98	2 large	P
3		08	36	98	2 large	P
4		08	44	44	2 large	P
5		08	51	50	2 large	O
6		09	08	65	2 large	O
7		09	12	36	2 large	O
8		09	13	49	2 large	P
9		09	13	31	2 large	P
10		09	14	59	2 large	P
11		12	41	50	1 large, 1 medium	O
12		12	51	89	2 large	P
13		15	21	63	1 medium, 1 small	P
14		15	42	66	2 large	P
15		17	23	75	2 small	P
16		17	24	84	1 large, 1 small	P
17		17	42	50	2 small	P
18		19	39	95	2 large	P
19		21	13	56	1 medium, 1 small	C

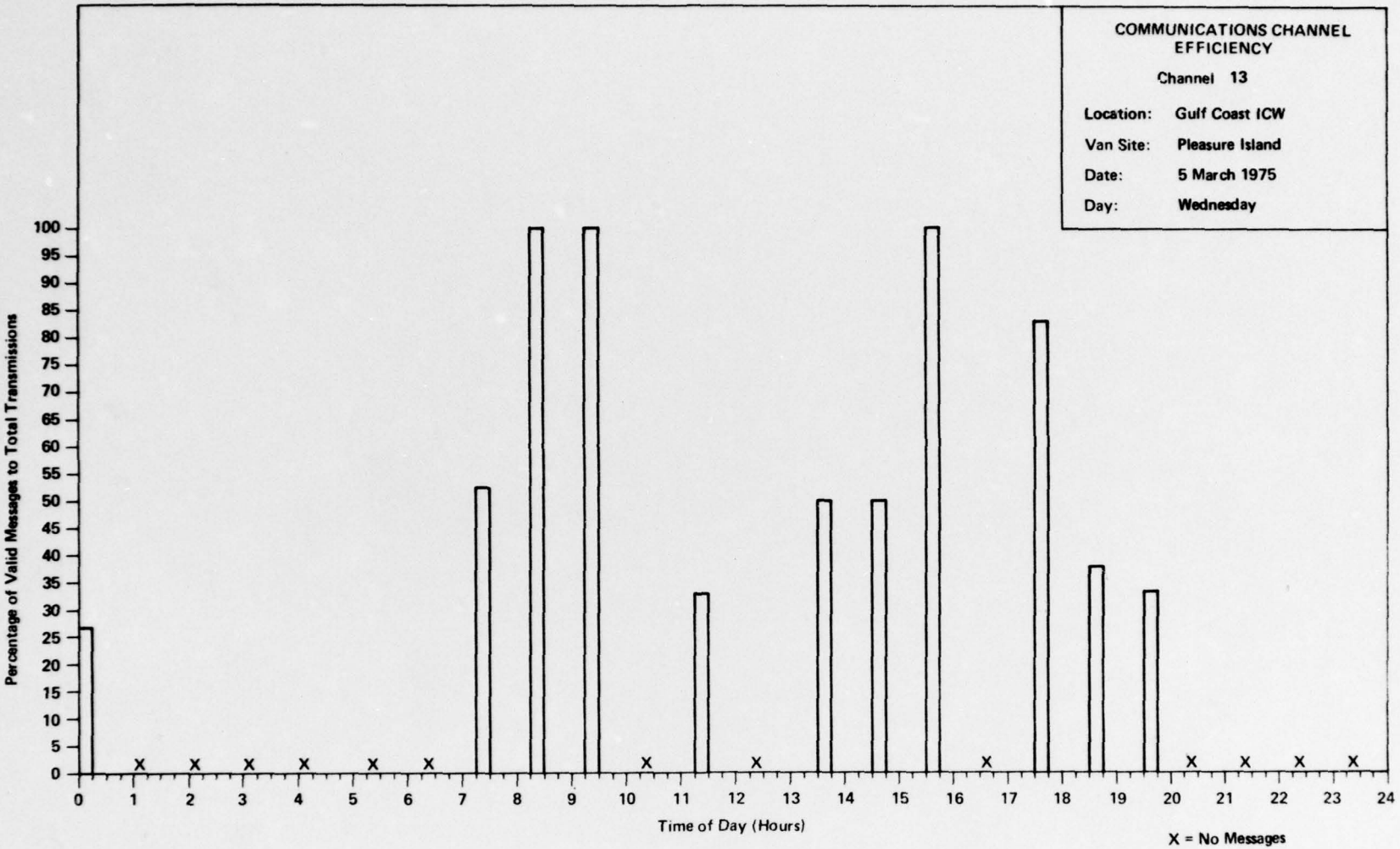
19 close encounters out of 31 total encounters in a 24 hour period.

*P = Passing
O = Overtaking
C = Crossing


East Basin
West Basin
Sabine Neches Canal
Route Identification for Pleasure Island
5 Hour Coverage - 24 Vessels
Sunday, 9 March 1975
Van Site
Small Ships
Medium Ships
Large Ships
Intracoastal Waterway
Port Arthur Canal
Magnetic North
Pleasure Island
Scale
1000
0
1000
2000
FEET


COMMUNICATIONS MESSAGE ACTIVITY
Channel 13
Location: Gulf Coast ICW
Van Site: Pleasure Island
Date: 5 March 1975
Day: Wednesday
96
Number of Messages
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Time of Day (Hours)
X = No Messages


COMMUNICATIONS CHANNEL UTILIZATION
Channel 13
Location: Gulf Coast ICW
Van Site: Pleasure Island
Date: 5 March 1975
Day: Wednesday
Utilization (Percent)
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Time of Day (Hours)
0 = Zero Percent


COMMUNICATIONS CHANNEL EFFICIENCY
Channel 13
Location: Gulf Coast ICW
Van Site: Pleasure Island
Date: 5 March 1975
Day: Wednesday
Percentage of Valid Messages to Total Transmissions
Time of Day (Hours)
X = No Messages